



FRIDAY, JULY 5.

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## Contributions.

## The Vestibule.

GAINES, WORCESTER, England, June 21, 1889.

TO THE EDITOR OF THE RAILROAD GAZETTE:

From your columns I gather that litigation is now being carried on with reference to vestibule connections. As a lad I can remember my late father, Mr. William Bridges Adams, being very busy in the matter of vestibules and their application to railroad carriages, and also to ordinary road omnibuses.

I feel sure that he patented it, and from the very voluminous nature of the specifications of all his patents I have but little doubt but that his specification covers all the ground in dispute. It will be quite 45 years back.

W. A. ADAMS.

## The Best Way of Revising Train Orders.

HINTON, W. Va., June 17, 1889.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Concerning the query printed in the *Railroad Gazette* of June 14, as to the responsibility of the train dispatcher for a certain collision between a work train and an extra freight, my idea is that the dispatcher put his foot in it when he failed to tell the conductor that an order extending his limits would be given when he (the work train) had got to the end of them, at B. He would not then have had an unnecessary order out. While not required to do so, the dispatcher should have said in the second order issued: "Will not go east of B. until extra west 18 has arrived, and after 2:30 p. m. will protect itself against extra 18 west of B."

Work-train conductors are generally selected for their ability as maintenance of way men, and not as transportation men; at least such is my experience. They are almost always old men taken from the track service. C. W. F.

[How about work-train engineers? Have they had their mental faculties stunted by track work?—EDITOR RAILROAD GAZETTE.]

## The Compound Again.

TO THE EDITOR OF THE RAILROAD GAZETTE:

My attention has just been called to an editorial in the *Car Builder* for June, which exhibits considerable soreness because of my remarks at the April meeting of the New England Railroad Club, during a discussion of a paper read by Mr. Angus Sinclair, editor of that journal. The editorial rather personally attacks your correspondent, and to his surprise, the author of the much criticized paper on compound locomotives, is allowed to use the editorial columns for personal dispute. The wandering statements by the *Car Builder* render it impossible to dispose of the reply to the criticism without rehearsing what is generally known and what has recently been very well brought out by the technical press. Discussion is valueless and endless when it leads to continual repetition of the argument and when the main points of the question are evaded.

Regarding your report of your correspondent's remarks at the club meeting I find that the statements as you publish them are exactly as made at that time. You will notice that, on p. 312 of your current volume, you have called attention to the fact that you did not make the statements accredited to you by the *National Car and Locomotive Builder*, and in addition to that I desire to say that a careful perusal of all of my remarks in connection with this matter will reveal the fact that there has not been made a single personal remark from the first, and I know of no publication which has made the statements which Mr. Sinclair imputed to your paper. The only personal statement made to my knowledge in connection with the matter was made by Mr. Sinclair at the club meeting, but was not recorded. I am now in the home of the compound locomotive, and having seen it in operation I am still of the opinion expressed in my remarks before the New England Railroad Club. In conclusion of the discussion, as far as I am concerned, I desire to state that after considerable inquiry among educated engineers on the subject, I see no reason to change the views I have expressed, and I am happy to say that the *Railroad Gazette* and all the strictly technical press, which has taken notice of the subject, have expressed opinions in harmony with my own, and have

so forestalled my remarks on the subject, that to myself I can accredit but little new expression, even where my opinions are the result of independent and personal investigation.

DAVID LEONARD BARNES.

INSTITUTION OF CIVIL ENGINEERS,  
LONDON, June 18, 1889.

## "31" and "19" Orders.

SAVANNAH, Ga., June 24, 1889.

TO THE EDITOR OF THE RAILROAD GAZETTE:

"Master of Trains" has asked a question in your issue of June 21 that has come to a great many thinking fellows, viz.: What would he do were he in charge of a train, with superior rights, should he get a meeting order and could not get complete? The answer is short. Stay right there until he gets authority to move. His superior rights are not worth a cent to him then, if the order he has received is a "31" order; that order takes away from the train crew every right which they had in the time-table. The rule says it is a hold order until "complete" can be given, whether that be ten minutes or ten hours. This is the meaning of a "31" order, as per Rule 510, Standard Code, as I understand it.

If "Master of Trains" will read rule 512 of the Standard Code he will see that a "19" order gives him just the privilege he refers to. It says: "If the line fails before an office has received and acknowledged the 'complete' to an order, the order at that office is of no effect," etc. The train then has the same rights as it had before the order was sent. I take it that the order takes effect at the point at which it is received, whether it be a "31" or a "19" order, but do not think it was ever intended that the two forms of orders should be used on the same road, but was left discretionary with the Superintendent as to which form he would adopt. The cases are rare where the failure of the wires causes a serious delay. The only merit that a "19" order has is, if "complete" cannot be obtained the trains fall back on their time-table rights, Rules 510 and 512, Standard Code, seem explicit, and the only question remaining seems to be which form shall be used. If a road adopts the "31" order, it means that after "O. K." is given the order is a hold order, and at the point at which the order is received, until such time as "complete" can be obtained. If the road uses only the "19" order, then the train is not held in case of failure to get "complete." This is my understanding of the matter, and agrees with the understanding of at least some of the parties who helped to make the rules. W. W. S.

[It is true that a "19" order has only one stage of completeness; it is either in full effect or else it is entirely worthless. But to say that this is its "only merit" is inaccurate. The committee did, indeed, say that roads could adopt either or both forms, but it could hardly have been expected that any road of any consequence would try to get along with form "19" alone. The special merit of this form is, not that there is less trouble when it is left only partially complete, but that it can be given out without waiting to get signatures. We cannot imagine, however, that a careful and experienced superintendent would make a practice of using it to make meeting points. Its chief legitimate use is for Form E 1, and especially on double-track roads, where the dispatcher is absolutely sure that the ruling train, say an east-bound passenger train, cannot do otherwise than comply with the order, and that the subordinate trains, say a dozen east-bound freights ahead of the passenger, cannot make a wrong move even if the order fails of delivery. In order to get in the way of the passenger train, the engineer and conductor of the freight must both misread the time named in the order. The "19" order is used for this purpose on the best roads, while at the same time they stick to the "31" for movements involving more risk of mistake.—EDITOR RAILROAD GAZETTE.]

## Cast-iron Car Wheels.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Until very recently cast-iron car wheels were nearly always purchased on a mileage or time guarantee, the specifications usually requiring the wheels to make from 40,000 to 60,000 miles under ordinary usage; or, failing to do this to be replaced, free of charge, with a new wheel by the maker. Usually some limits of weight were specified and the pressure which would be used in forcing in the axle also named. Years ago, when the loads carried in cars were not half what they are at present, and when charcoal irons of the best grade were alone used, and when competition was not as severe as now, this method of purchasing wheels and testing them afterward in actual service—bad as it undoubtedly was—for a time answered the purpose. A reasonably good article was produced, for which a fair price was paid, and the strength of the wheel, made of good material and loaded comparatively lightly, was ample for the time.

But afterwards the weight and capacity of the cars were largely increased, until from carrying 20,000 or 25,000 lbs. the load has been run up to 50,000 and 60,000 lbs. During this period of increase of load the weight and strength of the wheel has not kept pace; not over 10 or 15 per cent. has been added in metal, and the quality of iron used in their manufacture has been much poorer of late years. The effort to produce a cheap article had undoubtedly much to do in bringing about this condition of affairs. A wheel maker agrees to furnish wheels to give a certain mileage; if some do not, his part of the contract is fulfilled by replacing

the few wheels that fail to produce their mileage or that break in service. The loss from the wreck caused by the broken wheel, which may run up into thousands of dollars, is borne by the railroad company. It seems singular that so much recklessness should be displayed in the purchase and use of anything of such vital importance as a wheel, when a breakage is attended with so much loss and such disastrous results.

Within the last few years several leading railroads have specified certain systematic tests to be applied to one or two (usually two) per cent. of all wheels purchased. The method most in favor is to strike the wheel centrally upon the hub with a falling weight, a number of blows until broken in two or more pieces.

The force and destructive effect of the blow of a falling body varies according to the solidity and weight of the mass which it strikes and which absorbs the accumulated force of the weight. If the wheel is laid directly upon the ground or upon a springy foundation it will be found that the force of the blow will in a great measure be absorbed by the yielding nature of the resistance opposed to it. It is absolutely necessary, therefore, in order to get results which can be compared with tests made in various parts of the country, to specify the weight of the cast-iron plate upon which the wheel rests and the kind and depth of masonry used for the foundation. This gives approximately a uniform weight of material to absorb the momentum and force of the blow. The weight of the cast-iron plate usually specified is 1,700 lbs., to be set on rubble masonry 2 ft. deep. The number of blows which the wheel must stand, when laid flange downward upon three supports on the anvil block and struck centrally upon the hub without breaking into two or more pieces, varies from five blows for a wheel weighing between 540 to 575 lbs. to 8 blows for a 600-lb. wheel, the weight in all cases being 140 lbs.

The great value of some systematic method of testing a certain percentage of cast-iron wheels and finding out definitely the quality of iron used, the depth of chill and the strength as determined by the number of blows sustained before fracture, and the appearance of the iron before they are put in service cannot well be overestimated. It certainly does not reflect much credit upon railroad officers that purchasing and using car wheels has been conducted in such a careless manner, and such great and unnecessary risks taken.

Speaking generally, the most expensive way to test material is the so-called practical test of actual service without any preliminary investigation into its quality and strength, either by testing samples of such materials whose nature admits of cutting out or using a small portion without destroying the whole of the article, or a destructive test of a certain percentage of whole pieces or articles, when a certain number are selected at random and the quality of the entire lot determined by these representative pieces. The ratio that the expense of conducting reasonable and proper tests bears to the cost of the material is too small to be seriously considered compared with the probable saving in avoiding some expensive wreck caused by a broken wheel. In view of the fact that the test wheels are supplied by makers without charge (as to them it is only the matter of remelting the broken pieces), the actual cost need not exceed  $\frac{1}{4}$  of one per cent. to a railroad company.

In a record of railroad accidents from 1873 to 1887, compiled in the *Railroad Gazette* of Jan. 27, 1888, the total number of all kinds of train accidents for the 15 years was 17,637. Of this number 462 were caused by broken wheels, or 2.62 per cent. of the whole. If the number caused by collisions, obstructions, defect of track, etc., are omitted, and only derailments caused by breakages and defects in equipment considered, the number for 15 years is 1,316, and of this 418, or 31.7 per cent. were caused by broken wheels. It is but reasonable to suppose that a large number of these accidents could be directly attributed to the use of wheels of poor quality and the practice of testing their strength and durability in actual service.

The summary of the above is: Which is the most expensive, the small, known cost of intelligent, honest and scientific inspection and test, or the large, unknown cost of accidents and delays to traffic caused by broken wheels?

The moral (if any is needed) is—do not "buy a pig in a poke."

C.

## The Proposed Standard Brake Gear.

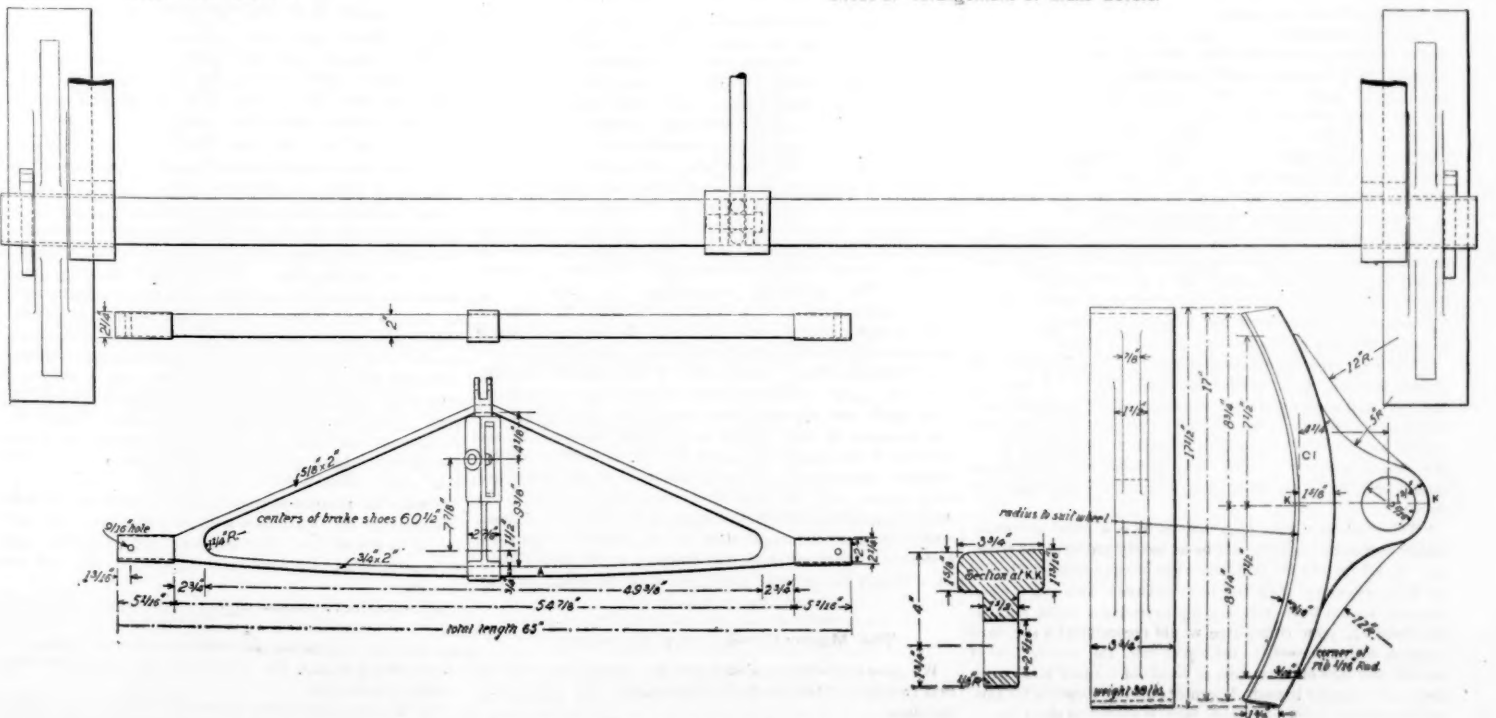
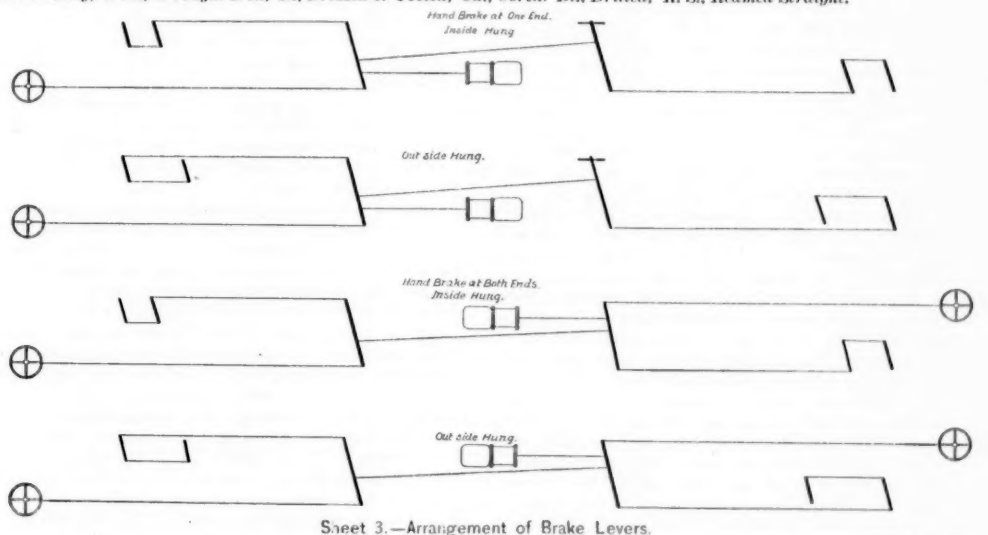
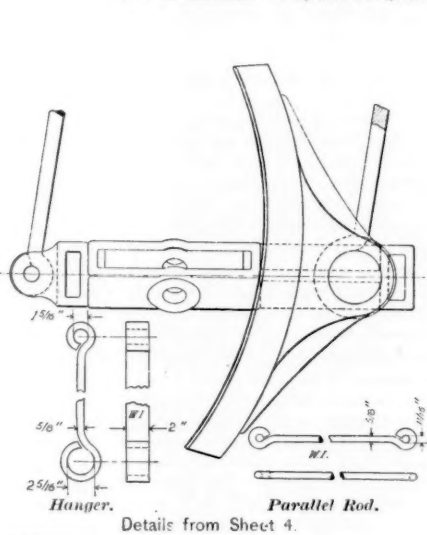
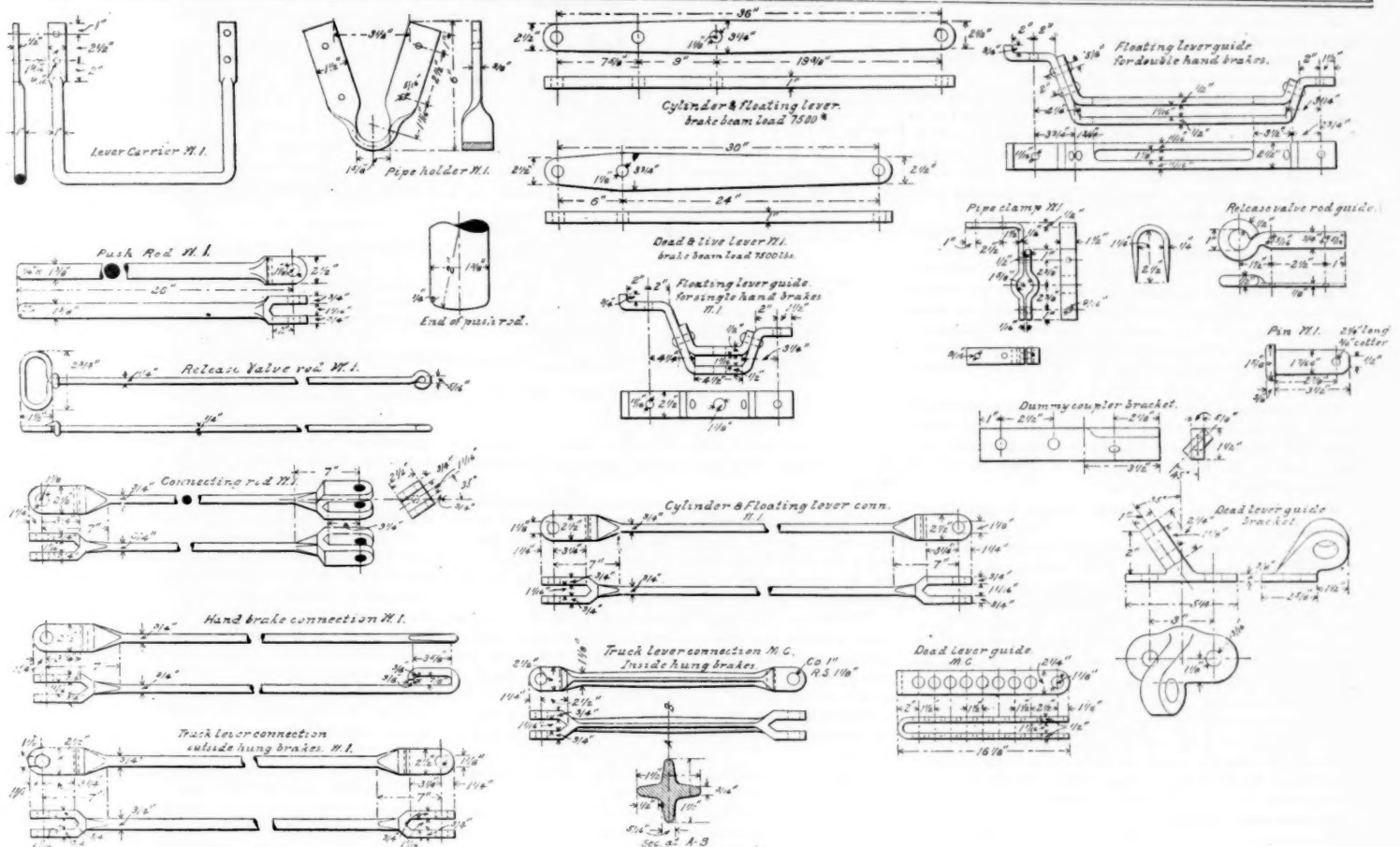
We gave last week the report of the Master Car-Builders' Committee on Standard Brake Gear. In this issue are given the sheets which accompanied that report, showing the general arrangement recommended and disposition and dimensions of parts in detail. The committee said: "As it is desirable that the arrangement of levers and rods in any brake gear should be as simple and have as few connections as possible, your committee has prepared plans showing the best arrangement for each of the following conditions: Inside connected brakes, with hand brakes at both ends; outside connected brakes, with hand brakes at both ends; inside connected brakes, with hand brakes at one end; outside connected brakes, with hand brakes at one end. The general arrangement of the gear for the first condition is shown on sheet No. 1, and the details for all on sheet No. 2. Diagrams of the general arrangement for each are shown on sheet No. 3. It was thought unnecessary to prepare drawings of the general arrangement for each of the conditions, as sheet No. 1 will serve as a guide for the other conditions, while the details for all the conditions are shown on sheet No. 2."

The standards recommended for letter ballot are as follows:

1st. That the maximum train pipe pressure be 70 lbs.







End of Beam, 2 in. diameter; Sleeve, 2 1/4 in.; Brake beam load, 7,500 lbs. Compression Member A, is made 1 1/4 x 2 in. for a load of 15,000 lbs.  
STANDARD BRAKE GEAR FOR AIR BRAKE CARS.

2d. That the brake power exerted on all freight cars be 70 per cent. of their light weight.

3d. That the arrangement of the brake gear for the four conditions named be as shown on sheet No. 3.

4th. That the details as shown on sheet No. 2 be adopted with all levers 1 in. in thickness. All pins be turned to  $1\frac{1}{8}$  in. in diameter, with  $\frac{1}{8}$  in. less. All jaws or clevises to be  $\frac{3}{4}$  in.  $\times$   $2\frac{1}{2}$  in. iron. All rods to be  $\frac{3}{4}$  in. in diameter and all other details as recommended.

5th. That the position of train pipe cock and dummy coupling be as shown on sheet No. 1.

6th. That the brake beams for all present forms of freight cars be required to stand a stress of 7,500 lbs. with a maximum deflection of  $\frac{1}{8}$  in., and where it is necessary to use a stronger beam that they stand a stress of 15,000 lbs., with a maximum deflection of  $\frac{1}{8}$  in. Where the Westinghouse beam is employed that the plan shown on sheet No. 4 be standard.

7th. That where independent brakas and rubbers are used that the present standard Christy or Collin rubber be maintained.

The committee is inclined to recommend hanging the brake beams from the trucks, and advises that shoe centres should come just below the horizontal line of wheel centres, and that no part of the brake gear should be lower than 5 in. from top of rail.

With regard to some of the details shown on sheet No. 2, the committee says:

"It was first decided that all levers should be 1 in. in thickness for the reason that a broad bearing surface is required at the connections to reduce wear and prevent lost motion, and further to facilitate interchange. In determining the widths of the levers this uniform thickness of one in. was taken into consideration, and a truck lever of this thickness 30 in. long to carry a load of 7,500 lbs., at a distance of 6 in. from one end should be  $2\frac{1}{2}$  in. wide at the ends and  $3\frac{3}{4}$  in. wide at the point of load. A cylinder lever of this thickness 36 in. long, cylinder connection  $7\frac{3}{4}$  in. from one end, and a load of 4,500 lbs. applied at a distance of 9 in. from the latter point, should be  $2\frac{1}{2}$  in. wide at the ends and  $3\frac{3}{4}$  in. wide at the point of load. These levers are shown on sheet No. 2, and should it be necessary to use levers of different lengths from these, or levers where the distance of point of load from end varies from those given, the proper widths can be calculated from the results as a basis.

"In an air brake gear it is most desirable to eliminate all lost motion possible, and inasmuch as the connections through the system of rods and levers are quite numerous a little play in each is felt at the cylinder. Your committee, therefore, recommends that all the pins in the gear be made  $1\frac{1}{8}$  in. in diameter, turned, less  $\frac{1}{8}$  in. to permit entering hole, and  $3\frac{3}{4}$  in. long under head, secured by a  $\frac{3}{8}$ -in. cotter pin, as shown on sheet No. 2 of details. This large diameter is recommended to prevent wear, and while it may seem to some unnecessary and costly, especially to turn them, it is thought that it will more than pay in the long run.

"The rod clevises or jaws to be in good proportion with pins of the above size should be made of  $\frac{3}{4}$   $\times$   $2\frac{1}{2}$  in. iron, as shown in sheet No. 2. They should have holes accurately drilled to  $1\frac{1}{8}$  in. diameter, twist drill preferred.

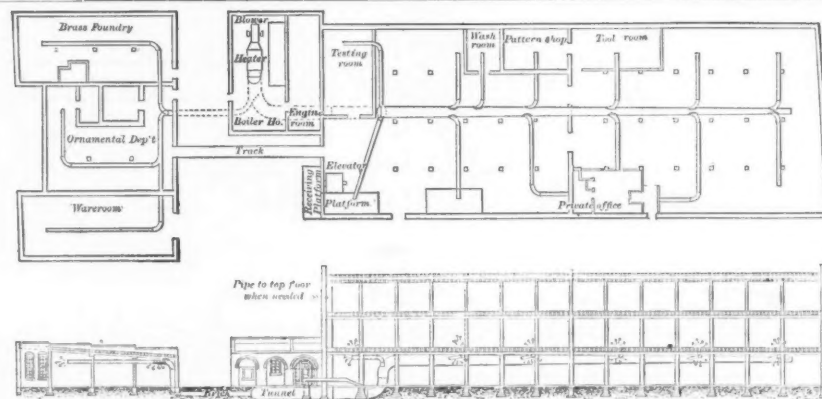
"The dead lever guide, by which adjustment of shoes to wheels is made, and by which all lost motion is taken up, is shown on sheet No. 2 in a form which your committee would recommend it. It is hinged from the truck, thus obviating the necessity of cutting a slot in the lever. The dead lever can consequently be made the same as the live lever and the necessity avoided of keeping a double stock of levers on hand. It is made of malleable iron and should be of sufficient length to take up the entire wear of the brake shoes without adjustment at any other point. The bracket for dead lever guide, shown on sheet No. 2, is only applicable to vertical channel bar trucks. It will have to be changed to suit the other form of trucks.

"Bottom connection of truck levers, which transmits power from the live to the dead lever, is subjected to either a compressive or tensile stress, according as the brake beams are inside or outside connected, and the form suitable to each condition is shown on sheet No. 2, as your committee would recommend them. That for inside connected brakes can be made most reasonably, it is thought, of malleable iron, and the section of a cross, as shown in sheet No. 2 would be most advisable. That for outside connected brakes should be of wrought iron,  $\frac{3}{4}$ -in. diameter, as shown.

"No allowance is made for the adjustment of brake gear or taking up of brake shoe slack by means of this connection. It is thought to be unnecessary and inconvenient to get at in many cases. It is recommended that all adjustment be made by means of the dead lever, for which the guide on sheet No. 2, and previously mentioned, is especially designed.

"The train pipe should be uniformly  $\frac{1}{2}$  in. in diameter for freight service. It is most important that it be securely fastened, and to this end your committee shows on sheet No. 2 the forms of clamps recommended. The location of pipe and clamps shown on sheet No. 1 is thought to be applicable to the great majority of cars. The pressure-retaining valve should be  $\frac{3}{8}$  in. in diameter and is secured with staples as shown.

"The location of train pipe stop cocks is a point of considerable importance and should be as nearly uniform as possible. As all freight air brake hose are of the same length, and as it is necessary that the hose between two cars, when coupled, should have sufficient dip to insure a tight joint at the coupling, your committee would recommend a standard location with reference to the top of rail, the centre line of the car and face of draw-bar, or inside of coupler hood when automatic coupler issued. The most suitable location for this, on the vast majority of freight cars, is shown on sheet No. 1, it being 13 in. from centre of car and 13 in. from inside of



MACHINE SHOP AND FOUNDRY HEATED BY HOT BLAST.

coupler hook or face of draw-bar to the centre of angle cock key. The height from top of rail to centre of pipe should be 33 in.

"The location of dummy coupling is also important, as upon it depends largely the life of air brake hose. It should be in a place and so attached that it is convenient for use and at the same time prevent the hose from kinking when the air hose coupling is put in the dummy. The location recommended is shown on sheet No. 1.

"The release valve and rods for operating it by which brake cylinders and reservoirs are bled should be located in such a manner that they will be convenient for use and protected from accident as much as possible. The location recommended is shown on sheet No. 1, the valves being screwed into the reservoir and the handles or rods extending on either side to the sides of the car, but not projecting beyond.

"The pressure retaining valve should be so located that it can be operated promptly by trainmen. Your committee recommend that it be placed on the end of the car having hand brake near the roof, as shown on sheet No. 1. It is important that it be well secured.

"Two forms of brackets are shown on sheet No. 2, one when hand brakes are connected at both ends, and the other when hand brakes are connected at one end. To suit the varying arrangement of sills and dimensions of cars it will be necessary in many cases to depart from the exact design given in the drawings; however, the same sizes of iron can be used. It has been the endeavor of the committee to give only such dimensions for these and other parts as will not vary with the varying construction of cars. Wherever possible, we have given exact forms; in other cases we have endeavored to furnish a guide."

Sheet No. 4 shows the Westinghouse beam as recommended. This beam is of rectangular section, and it will be seen that the compression member is given a camber. This is a recent modification, introduced since the committee's tests began, and is a part of the process of increasing the strength of the beam of which we spoke editorially last week. In addition to the introduction of this camber, the ends of the beam were thickened. A typographical error made us say that the beam had been straightened. The error was obvious, however. On the same sheet is shown the solid shoe recommended by the committee. The circumferential face is 18 in. long, and it has 30 per cent. more wearing surface than the present M. C. B. standard. It will be remembered that the committee strongly recommended a soft cast-iron shoe.

#### Heating Shops and Factories by Hot Blast.

The figures herewith presented show the method adopted by the Buffalo Forge Co., Buffalo, N. Y., to heat shops and factories. As will be seen, fresh air is forced by a blower around a steam radiator, whence it is delivered by pipes to different parts of the building. The steam radiator consists of a number of coils with return-bends connected to manifolds, the steam supply pipes being attached in such a manner that live steam or exhaust can be used in the radiator at pleasure, or exhaust steam can be used in one portion of the radiator and live steam in the other. The blowers employed for forcing the air are made in a variety of sizes and styles, to be operated either by a belt or by a special engine coupled directly to the blower shaft. The principal advantages of heating by forced blast consist in the abundant circulation of fresh air and the economy of the heating plant. In heating by steam the condensation is practically instantaneous, and the amount of air heated by each square foot of the radiator depends, when the supply of steam is ample, directly upon the velocity with which the air circulates around the heating surface. For example, if each square foot of the radiator, at one velocity of air, heats 100 cubic feet of air per hour to the required temperature, when the velocity of the air is doubled, each square foot will heat 200 cubic feet per hour to the same temperature, if sufficient steam is supplied. The figures, which illustrate the application of the Buffalo Forge Co.'s system to a machine shop and foundry at St. Louis, Mo., show clearly the general arrangement of the plant and the manner of distributing the heated air.

#### The Master Car-Builders' Convention.

We gave last week an abstract of the proceedings for the first two days of the Saratoga Convention of the Master Car Builders.

On Thursday the report of the Committee on Steam Heat-

ing was received. An abstract of this was given last week. In the discussion which ensued Mr. F. D. Adams called attention to the fact that no allusion was made to the Boston & Albany and New York Central, although he was confident that those companies had replied to the circular.

Mr. ROBERT MILLER explained that the Committee had been very much hampered in its work by the fact that the members had been unable to come together, and the Chairman had been entirely unable to give any attention to the subject after the replies came in, owing to his having been entirely occupied by the work consequent upon the flood. On motion the Committee was continued. Mr. Marden suggested that the subject ought to be discussed, as many railroads will be compelled to put on steam heating, and their officers will look to this Association for information. Other members agreed with Mr. Marden that this part of the proceedings should take the form of an experience meeting.

Mr. KIRBY stated that his experience with the Martin system had shown that too much piping was used in the cars. The sleeping cars running in the rear of their trains had frequently been equipped with another system, and it had been necessary to carry considerable pressure, more, probably than the constructors of the Martin system had intended, to have carried when piping. His company will probably take out some of the spurs under the seats, and then, with a better coupler, he thinks they can get along very well.

Mr. F. D. ADAMS stated that the greater part of their rolling stock had been equipped with the Martin system for two years. The slip-joint coupler was undoubtedly bad. It proved leaky. But the new ball-joint had been used experimentally for the past winter, and Mr. Adams thinks it will answer the purpose. They have taken out, or will take out, all the spurs under the seats, depending for radiating surface upon the two lines of 2-in. pipe, leaving just enough bends in the pipe to take up expansion and contraction.

Mr. KIRBY said that overheating was caused from the almost inevitable carelessness of conductors and brakemen. The pressure at the outset must be considerable to get the train quickly heated. After the train is heated the trainmen do not notify the runner to shut off some of the pressure.

Mr. ROBERT MILLER had found it very difficult to regulate the pressure throughout the train. With an initial pressure of 30 lbs. on the engines, the pressure in the train pipe would be reduced to nothing in the rear car, and, consequently, the front cars were overheated and those in the rear inadequately heated. The Committee calls attention, therefore, to the return system as a possible solution of this difficulty. Mr. Bissell also stated that they had found difficulty in keeping steam-heated cars cool enough.

Mr. DOLBEER had found it impossible to restrict sufficiently the supply of steam through the system and had concluded that too much radiating surface was used. He had found also that the slip joint is not practicable, and is not sure that the ball joint will be better.

Mr. MILLER had condemned the slip joint from the start, and is apprehensive that the ball joint will leak after wear.

Mr. J. N. BARR stated that he had used more radiating surface than the other speakers apparently had, but he found that it was none too much for a temperature of from 30 to 30 degrees below zero. His company is trying a regulating device to automatically shut off steam when the temperature of the car gets up to 70, and he thinks that something of the sort must be used. He explained the ventilating device in use by his company, which is found to work well. Our readers will probably remember that this device consists in a radiating coil placed in a box at one end of the car over which the air is passed as it comes in from a hood above the roof. They have found that in the severe climate of the Northwest the train pipe carried under the cars is sure to freeze up and have adopted an overhead train pipe, which they will, undoubtedly, continue to use. With this system the water of condensation is disposed of by natural drainage. When asked his experience with sleeping cars on the rear of trains, he stated that they had had very satisfactory results in heating their sleeping cars. They used the old Baker heater.

Mr. CASANAVE considered that steam heating was yet in its infancy; that we have not yet data sufficient for coming to any definite conclusion as between different systems, and therefore urged that the Committee be continued without further discussion.

Mr. MARDEN stated that those interested in steam heating are very much interested and want to know about it now.



He suggested, therefore, that the discussion ought to continue and incidentally suggested that probably it would be desirable to divide the convention into two or more simultaneous meetings, in order that those interested in one subject need not be compelled to spend their time listening to the discussion of another in which they are not interested.

Mr. BLACKALL gave some of the experience of his road in the use of the McElroy system. They have had a temperature of 86 degrees below zero at times, and have had no failure in the last winter. They use thermometers in the cars and try to keep the temperature at 65, and succeed pretty well in doing so.

Mr. GRIEVES said that a steam heating law will soon take effect in Maryland, and his company is obliged to soon settle upon something. They now have 75 cars equipped with steam heating, and have accumulated some experience. On postal cars they have the McElroy, and on passenger cars a system of their own, something like that used on the St. Paul. They have, however, no ventilating arrangement, but are trying the Johnson electric regulator. From their experience, the question of the coupler is the one of principal difficulty. They can heat the cars readily enough, and find no difficulty in regulating the temperature, but they want the question of the coupler settled.

Mr. SCHROYER had experimented a good deal, and had fitted up his cars with a radiating surface of 28 sq. ft. to 100 cub. ft. of car space, and from this had gone up and down, experimenting with greater or less area of radiating surface. The mechanical officers of the road had gone out with the trains and watched the results very carefully. He had found nothing yet that he could recommend as absolutely satisfactory for the adoption of his company. The difficulties found had been unequal heating of the trains and of individual cars, freezing of traps and valves, and failure of the men to understand and properly work the various details of the system. In fact, while they had had no trouble in sufficiently heating a car, they had had a great deal of trouble with details. So far as the trap goes, he had found the best results from one which retained the water of condensation and does not let it bleed out.

As a result of the discussion the subject was continued, but the Committee was discharged.

The report of the Committee on Standard Brake Gear was read and accepted. This report was published in the *Railroad Gazette* of June 28, and the drawings which accompanied it are reproduced in this issue. It was voted to submit the designs and dimensions recommended by the committee to letter ballot for adoption as standards. There was no discussion of the report.

The report of the Committee on Specifications for Cast-iron Wheels was received and the Committee discharged. It was resolved to submit the specifications and guarantee recommended by the Committee to letter ballot for adoption as standard.

#### SPECIFICATIONS FOR CAST IRON WHEELS.

1. The chills in which the wheels of any one wheelmaker are cast shall be of equal diameters, and the same chill must not vary at different points more than  $\frac{1}{16}$  in. in diameter.

2. Wheels of the same nominal diameter furnished by any one wheelmaker must not vary more than  $\frac{1}{16}$  in. above or below the mean size measured on the circumference, and the same wheel must not vary more than  $\frac{1}{16}$  in. in diameter. The body of the wheel must be smooth and free from slag, shrinkage or blow-holes. The tread must be free from deep and irregular wrinkles, slag, chill cracks and sweat or beads in throat, which are  $\frac{1}{16}$  in. or over in diameter, or which occur in clusters of more than 6 in. in length.

3. The wheels broken must show clean gray iron in the plates; the depth of pure white iron must not exceed  $\frac{1}{16}$  in. or be less than  $\frac{1}{16}$  in. in the middle of the tread, and shall not be less than  $\frac{1}{16}$  in. in the throat. The depth of the white iron shall not vary more than  $\frac{1}{16}$  in. around the tread on the rail line in the same wheel.

4. For each hundred wheels which pass inspection and are ready for shipment, one representative wheel shall be taken at random and subjected to the following test:

The wheel shall be placed flange downward on an anvil block weighing not less than 1,700 lbs., set on rubble masonry at least 2 ft. deep, and having three supports not more than 5 in. wide for the wheel to rest upon. It shall be struck centrally on the hub by a weight of 140 lbs. falling from a height of 12 ft. Should this wheel stand 5 blows without breaking into two or more pieces, the hundred wheels shall be accepted.

The above test shall apply to standard weight wheels from 26 to 42 in. in diameter used on the standard gauge roads.

Or, the wheel shall be placed flange downward on a cast iron ring weighing 1,000 lbs., the outside diameter of the ring being 36 $\frac{1}{2}$  in., the inside diameter 24 in. and thickness 8 in., supported on rubble masonry at least 2 ft. deep. It shall be struck on the plate, close to the rim, by a weight of 100 lbs. falling from a height of 7 ft. When subjected to this test a 550-lb. wheel shall stand 20 blows; a 575-lb. wheel, 25 blows, and a 600-lb. wheel, 30 blows, without breaking a piece out. This test applies to 33-in. wheels, 26, 28 and 30 in. wheels must stand the 25-blow test, and the 36 and 42 in. wheels must stand the 30-blow test.

5. Should in either case the test wheel break in two or more pieces with less than the required number of blows, then a second wheel shall be taken from the same lot and similarly tested. If the second wheel stands the test, it shall be optional with the inspector whether he shall test a third wheel or not. If he does not so elect, or if he does and the third wheel stands the test, the hundred wheels shall be accepted.

6. Wheels shall not vary from the specified weight more than two per cent.

7. The flange shall not vary in the same wheel more than  $\frac{1}{16}$  in. from its mean thickness.

8. All wheels shall be numbered consecutively, and shall have the number, also the day, month and year when made, plainly formed on the inside plate in casting, and no two wheels shall have the same numbers.

#### GUARANTEE.

THIS INDENTURE, made this.....day of.....18.....and between.....party of the first part, and.....party of the second part, witnesseseth:

The party of the first part hereby agrees to furnish to the party of the second part, free on board cars at.....chilled cast-iron wheels.....inches in diameter for use under.....

2. The party of the second part hereby agrees to pay to the party of the first part.....dollars for each wheel furnished, and to keep an accurate record of the mileage made by the wheels placed in service under cars in passenger equipment and under locomotives and tenders, and an accurate record of the number of months of service of the wheels placed in service under cars in freight equipment.

3. The party of the second part hereby agrees that when any wheel furnished under the contract is scrapped, to furnish to the party of the first part a statement which will show:

1. The wheel number.
2. The service in which the wheel ran.
3. The amount of service in months or miles.
4. The cause of failure.
5. A charge against the party of the first part of 55 per cent. of the price of the wheel mentioned above.
6. A credit to the party of the first part of

.....cents per 1,000 miles for 36, passenger equipment.

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Selling price of wheel.	Credit to maker per 1,000 miles.	Cost in cents per 1,000 miles to user if wheel makes a mileage of				
		40,000	50,000	60,000	70,000	80,000
10 cents.	21.25	19.	17.50	16.43	15.62	
9 "	20.25	18.	16.50	15.43	14.62	
8 "	19.25	17.	15.50	14.43	13.62	
7 "	18.25	16.	14.50	13.43	12.62	
6 "	17.25	15.	13.50	12.43	11.62	
10 cents.	20.125	18.10	16.75	15.79	15.06	
9 "	19.125	17.10	15.75	14.79	14.06	
8 "	18.125	16.10	14.75	13.79	13.06	
7 "	17.125	15.10	13.75	12.79	12.06	
6 "	16.125	14.10	12.75	11.79	11.06	
10 cents.	19.	17.20	16.	15.14	14.50	
9 "	18.	16.20	15.	14.14	13.50	
8 "	17.	15.20	14.	13.14	12.50	
7 "	16.	14.20	13.	12.14	11.50	
6 "	15.	13.20	12.	11.14	10.50	

Report not signed.

J. N. BARR,  
JOHN KIRBY,  
GEO. F. WILSON.

Committee.

The report of the Committee on Standard Axle for 60,000-lb. Cars was read by the Chairman, Mr. Rhodes, as follows:  
A STANDARD AXLE FOR CARS OF 60,000 LBS. CAPACITY.

In submitting figures for a standard axle for cars of 60,000 lbs. capacity, your committee calls attention first to the action taken at previous conventions. At the annual meeting, held at Minneapolis in 1887, an axle of dimensions shown in fig. 1 [figures not reproduced.—Ed.] was presented and submitted to letter-ballot vote. The leading dimensions are: journal 4 x 8 in., wheel fit 5 x 6 $\frac{1}{2}$  in., centre of axle  $\frac{1}{2}$  in., distance from centre to centre of journal 6 ft. 4 $\frac{1}{2}$  in. The design was rejected by the following vote, a two-third vote being necessary for adoption:

In favor of.....397  
Against.....253  
Total.....650

At the Alexandria Bay meeting last year the design represented in fig. 2 was voted to be submitted to ballot vote. A marked difference will be noticed in the dimensions of this axle, especially the diameters. The journal is 4 $\frac{1}{2}$  by 7 $\frac{1}{2}$  in., the wheel seat, 5 $\frac{1}{2}$  by 7 $\frac{1}{2}$  in.; centre of axle, 4 $\frac{1}{2}$  in., and distance from centre to centre of axle, 6 ft. 3 in. This design was also voted down, as follows:

In favor of.....224  
Against.....307  
Total.....531

The discussions and investigations that have taken place since the last annual convention disclose a growing disposition for the larger diameters shown in fig. 2, and while your committee is not sanguine of presenting an axle that will reconcile all conflicting views, it is hoped that by taking the subject up in parts, portions at least of the axle may be adopted so as to admit of a uniform wheel, journal box and brass, all of which are essential for repairs in car interchange. We recommend the following dimensions:

Diameters.		
1. Diameter of journal.....	4 $\frac{1}{2}$ in.	
2. " wheel fit.....	4 $\frac{1}{2}$ in.	
3. " centre of axle.....	4 $\frac{1}{2}$ in.	
4. " collar.....	5 $\frac{1}{2}$ in.	
5. " dust guard seat.....	5 $\frac{1}{2}$ in.	

Lengths.		
6. Length of journal.....	8 in.	
7. " wheel seat.....	7 $\frac{1}{2}$ in.	
8. " dust guard seat.....	2 "	
9. " collar.....	6 ft. 3 $\frac{1}{2}$ in.	
10. " centre to centre of journals.....	6 ft. 3 $\frac{1}{2}$ in.	
11. " over all.....	7 " 3 $\frac{1}{2}$ in.	

Notes.—Mr. McKenna dissents from dimensions given for Nos. 8, 10 and 11, recommending in lieu of them as follows:

8. Length of dust guard.....	2 $\frac{1}{2}$ in.
10. " centre to centre of journals.....	6 ft. 4 $\frac{1}{2}$ in.
11. " over all.....	7 " 2 "

GODFREY W. RHODES,  
JNO. S. LENTZ,  
ROBT. MCKENNA,  
Committee.

Mr. RHODES moved that the dimensions recommended by the committee be taken up item by item and acted upon, with a view to submitting them to letter ballot for adoption. The committee has found a decided inclination among mechanical officers to meet on the matter of diameters and, therefore, recommends that action be first taken on the various diameters specified. The dimensions recommended by the committee were adopted with but little discussion. Mr. Adams suggested that the diameter of centre of axle should be 4 $\frac{1}{2}$  in. instead of 4 in., as recommended by the committee, in order to give greater stiffness to the axle. Mr. Rhodes explained that the dimensions arrived at by the committee was the result of careful calculation and had been adopted to make the axle symmetrical throughout as regards strength of various parts.

Action was next taken on the question of length.

Mr. BARR had been one of the most determined supporters of a 7-in. journal, for reasons which he has frequently stated in discussions elsewhere. He is of the opinion, however, that the adopt on of a standard axle for 60,000-lb. cars will be followed by the use of that axle for all new cars and in repairs, and therefore that the dimensions of boxes, etc., will speedily be adapted to the use of the standard journal. He will vote, therefore, for the journal length recommended by the committee.

Mr. VERBRYCK also would vote for the 8-in. journal for the same reasons which governed Mr. Barr.

The principal discussion arose over the lengths of axle from centre to centre of journals.

Mr. WALL stated that the Pennsylvania system in designing their present standard had studied the matter very carefully. They had nothing to go by in the way of standards, and had adopted their present length of 6 ft. 4 $\frac{1}{2}$  in. from

With these remarks the specifications and guarantee are submitted with the belief that they are fair to both wheel user and wheelmaker; that these provisions will have a tendency to secure a safe and reliable wheel, and to induce makers to pay close attention to the question of durability, and in this way reduce the actual cost of mileage to the consumer.



careful investigation of the subject. They now have 10,000 cars running with that length of axle. It will be impossible for them to change the dimensions of their trucks, which are of the vertical channel-iron type, and therefore if an axle 6 ft. 3 in. centre to centre of journals is made standard the Pennsylvania system cannot adopt it. Other roads are in the same situation. He therefore recommended the adoption of two standards one as recommended by the majority of the committee and one as recommended by the minority in their report. Mr. M. M. Martin and Mr. Schroyer also spoke for the use of a longer axle.

Mr. BARR thought that they were making greater difficulties than were necessary. The long axle may now be used under 25,000 cars. Probably the shorter one is in use under 250,000, or perhaps 500,000. As a matter of practice the St. Paul road loses nothing in changing its heavy axles to cars doing lighter service, and he thinks that all roads will find the economy of having all of their trucks built to take in axles of uniform length, so that the same axle could be changed through all classes of service. There is a technical objection moreover to lengthening the axles in that it increases the leverages. The dust guard seat can be made sufficiently long by setting the wheel in a little, which also increases the stiffness of the axle. He has had tens of thousands of dust guards in service, with a seat  $2\frac{1}{4}$  in., and has no doubt that 2 in. is sufficient.

Mr. RHODES was inclined to vote for the amendment, although he thinks that the longer axle is a mechanical mistake. The most economical practice is undoubtedly to have the axles interchangeable for all classes of service.

Mr. MARDEN asked if Mr. Wall would continue to build for a 6 ft.  $4\frac{1}{4}$  in. axle if the shorter one is adopted as standard, that is, if there are good technical reasons for the longer dimensions.

Mr. MILLER stated that when the Pennsylvania Co. began building 60,000-lb. cars with the long axle, he had an opportunity to see the cars frequently in construction and to become familiar with the whole design. He declined, however, to take the longer axle and considered that there are decided advantages in keeping the leverage short. Therefore, he shall vote for the 6 ft. 3 in. axle.

Mr. SCHROYER said that there are now apparent votes enough to defeat the effort for one axle 6 ft. 3 in. centre to centre of journals, and therefore urged that a compromise should be made on two standards.

Mr. WALL said that the Pennsylvania people would not vote against the 6 ft. 3 in. standard, but would like to have two standards. In any event, the adoption of the 6 ft. 3 in. standard by the other companies would facilitate repairs and interchange of cars. They should vote therefore for this standard, but would be obliged to use their own axles.

Mr. WALL's amendment was lost, and the report of the committee was adopted, except the note giving the opinion of Mr. McKenna as a minority of the committee.

Mr. J. H. Setchel was proposed as an associate member.

The report of the Committee on Buffers and Carrier Irons for the M. C. B. coupler was then read. An abstract follows:

#### BUFFERS AND CARRIER IRONS FOR THE MASTER CAR-BUILDERS' TYPE OF COUPLER AND A STANDARD LENGTH OF DRAW-BARS.

We have had some considerable correspondence with parties having cushioned buffers, such as the Van Dorstan, which is a direct buffer secured to the end sills or the dead-wood block of the car; the construction of which is a cast-pocket with cast buffer block fitted to the pocket and block of rubber set in bottom of pocket against which the buffer block rests. We have also been in communication with W. H. Bowman, of Rochester, N. Y., with reference to the Crouch air buffer, which is a cast-iron cylinder placed behind the draw-bar. It is not, however, sufficiently developed to warrant any recommendations from your committee at the present time. Your committee has also considered the Westinghouse buffer, which is attached to the draught-rigging and takes the blow through the draw-bar.

The difficulties we encounter in recommending a buffer for use with the M. C. B. type of coupler are, in fact, that we have been unable to discover any buffer except the Westinghouse and Crouch, which perform their functions when the knuckles of the bars are closed (as they invariably are in switching), and we believe that a large portion of the damage done to our draught-rigging is while the switching is being done, in dropping cars down side tracks, and in cases of this kind the Van Dorstan style of buffer is not operative at all, but the knuckle has then got to take the entire force of the blow. This would necessarily lead us to look in the direction of the Westinghouse or Crouch buffers for a device to be of practical service at all times, but your committee do not consider either of these devices sufficiently developed to warrant recommendations for adoption.

A great many of the roads now using the M. C. B. type of coupler are omitting dead-wood castings entirely; some are using the single dead-wood block, while others again are using the block with the dead-wood castings bolted to the same, thus relieving draw-bar spring of the shock when coming together in making a coupling, but it does not relieve the draught-rigging of any blow when the shock is taken with the knuckles closed; hence we refrain from making any recommendation in this direction until something more practicable has been devised.

The question of carrier irons is one in which we have met considerable opposition even among ourselves as a committee.

Mr. Grieves, of our committee, has had some trouble with the standard bar as a result of the narrow neck (5 in. in width) allowing the bar to twist in the carrier irons when struck on the face of the knuckle by the old style bar, and he claims that with a bar with 13 in. as the width of the head and with the blow taken on the side through the knuckle, as it necessarily is with the M. C. B. type of bar, the neck is too narrow to sustain the heavy weight of the head and prevent it from twisting in the carrier irons.

The following is an extract from copy of a letter written by Mr. Grieves to Mr. Wall and myself:

"I have talked with our Superintendent M. P. A. J. Cromwell, and would say we have become thoroughly convinced that the barrel or neck of the Janney coupler, which is 5 in. x 5 in. (I refer to the part passing through the carrier iron), is not at all heavy enough. This has been thoroughly demonstrated in our experience with the use of Janney

couplers on freight cars, and when we commenced to apply the American continuous draw-bar to our cars, we made this part of the drawbar  $5\frac{1}{2}$  in. x 6 in., which we think strong enough. We think that in considering the length of draw-bar, the matter of strengthening up the barrel or neck of the Janney coupler should also be taken into consideration, as 5 in., in the horizontal measurement of the barrel, is not sufficient to balance the head on the automatic type of coupler and bear the immense strain it receives by concussion when in service. We would suggest this part of the coupler be thickened up and made not less than  $5\frac{1}{2}$  in., measuring across the barrel. The necessity for strengthening the Janney coupler on passenger cars has been clearly demonstrated. The barrel on the old style of passenger car coupler was 5 in. x 5 in. at the point where it passes through carrier iron, but on the new style of Janney coupler which we have adopted for all passenger cars it is  $6\frac{1}{2}$  in. x 5 in."

On receipt of this letter, a copy of the same was referred to the McConway & Torley Co. The following is an extract from their letter in reply to Mr. Wall on this subject:

"From the letter of Mr. Grieves, which you inclose, we see that he is inclined to think that the neck of the Janney coupler, both for freight and passenger cars, is structurally weak and he urges as the proper remedy for this alleged weakness an increase in the dimensions of the neck from 5 in. by 5 in. to  $5\frac{1}{2}$  in. by 6 in. Mr. Grieves states that he bases his opinion upon unsatisfactory service rendered by the Janney couplers in use on the Baltimore & Ohio Railroad. You ask if we have received complaints of failure of couplers in this particular.

"While a theoretical comparison of strength of material and cross-section must govern the shaping of an experimental model for a coupler, the practical results obtained from actual service form the only safe criterion for the development of that model. Such practical experience we claim to have had, in greater degree probably, than any other makers of automatic couplers. We have now furnished over 40,000 Janney freight couplers to railroads representing between 40,000 and 50,000 miles of road. We have made changes in our model as experience suggested their utility, and have kept careful record of the breakages that came to our notice, and have endeavored to tabulate such breakages in a way that would give us an insight into their cause, and enable us to apply the proper remedy.

"Up to about January, 1888, we did not have in service a very large proportion of freight couplers as strong as is the coupler we now designate as the 'Model of '88.' That model was the resultant of a great deal of work and a very considerable amount of breakage in the couplers which had gone into service prior to and during 1887. Taking our experience and observation as basis, we designed the model of '88, and from the date in which it went into service we made arrangements with three of the largest users by which report of all breakages and the character of the same should be made to us. These companies have now in service 12,012 freight couplers, most of which went into service prior to the current year. Our purpose in having these reports made was to inform ourselves as to the adequateness of the measures which we had taken to strengthen the coupler. Our investigations were made to cover the New York Central system, the Erie and the 'Bee Line,' and these roads were selected because just at this time they were all applying couplers rapidly and in large quantities, and the service would give a fair criterion for our judgment. The figures given hereafter refer to these 12,012 couplers only, and we allude only to the above-named railroads when we speak of 'test railroads.'

"We inclose a sketch showing four different types of breakage which may be supposed to support Mr. Grieves' theory of weakness in the neck of the coupler. Of breakage like that shown in fig. A, we have a single case out of 4,000 couplers in service on the railroad where this breakage occurred. Fig. B also represents an isolated case of such fracture of the couplers in service on the railroad where this breakage occurred. Together they represent a total of 2 couplers of the 12,012 couplers in service on the test roads. Figs. C and D represent respectively a loss of 2 and 13 couplers out of the total number in service on the test roads. [These drawings will be given in a later issue.—Ed.]

"While it is conceivable that some of the terrific shocks which the M. C. B. coupler is obliged to sustain when used, as at the present time in service with the link coupler may break a coupler of the most perfect material, the fact is nevertheless true that in the cases of nearly all of the above mentioned couplers there was a directly traceable cause of breakage not in any way connected with the design or dimensions of the couplers. While breakages as in fig. D have not been large in the aggregate, still we have been led to seek out their cause and apply a remedy. Our first pattern had the barrels turned from a piece of wood squared to 5 in. by 5 in., and the turning of a perfect cylinder made the barrel about an eighth of an inch smaller than the square neck, and gave a shoulder which we now think undesirable. This has been remedied, and the barrel now has a full diameter of 5 in., thus meeting flush with the square neck. This greatly strengthens the connection between barrel and neck, and will, we believe, prevent breakages of the D type. An increase in external dimensions would have had the serious objection that all twenty odd thousand cars now equipped with automatic couplers would no longer be standard nor could the proposed standard coupler be applied to them for repairs without changing the stirrup strap. An increase of metal without change of external dimensions we hold to be inadvisable, first, because experience shows the present thickness to be amply strong, and secondly, because it would necessitate a reduction in the size of the head of the draught bolt to permit of insertion, and thus decrease the bearing surface at the crucial point in the tail of the coupler. To incur these disadvantages to prevent a possible loss, .0014 per cent. of breakage seems quixotic.

"As to the passenger coupler, it is true that we manufacture two styles of standard passenger couplers, the No. 1, with a 5 in. x 5 in. neck, and the No. 1 P. with a  $6\frac{1}{2}$  in. x 5 in. neck. This increase in the width of the neck is in no sense due to the weakness of the 5 in. x 5 in. neck, but exists only in our Janney coupler for use with the combination Janney-Miller platform and coupler. In order to accommodate the lateral motion of the Miller hook, we are obliged to have a wide stirrup strap, and to prevent this lateral motion of the Janney coupler, when it is substituted for the Miller hook in the same stirrup strap, we have increased the width of the neck of the Janney coupler. The B. & O. R. R., for reasons of their own, have recently adopted the use of the combination Janney coupler No. 1-P. in place of the standard Janney coupler No. 1, and doubtless find that it gives good service; but as we have not the record on which they based their judgment and changed their standard, we cannot give an opinion as to the matter of policy.

"It occurs to us that Mr. Grieves may not be aware that there is a difference in the thickness of material in neck of passenger coupler as compared with the freight coupler upon his conception of the passenger coupler. The thickness of the passenger coupler is  $\frac{3}{4}$  in., while the freight coupler is  $\frac{1}{2}$  in., making their comparative strength as 16 to 25, or, in other words, the cross section of the freight coupler is 50 per cent. stronger than the cross section of the passenger coupler. Our

experience up to this time prompts us to object to any change in the dimensions of the neck."

The opinion of the McConway Torley Co. must surely have very great weight on this subject, as they are more directly interested in the proper sizes of the bar at this point than probably any of us present here to day, especially as they are willing to stake the reputation and success of their on the size of this neck.

While the subject matter of the committee is not to recommend the proper size of the neck of the bar, the carrier iron necessarily involves specifying something that fits to the same, and in view of the large number of bars which are now in service and the tests which have been made of the same by the McConway Torley Company, we, as members of the committee, cannot see our way clear to recommend any other size than that in service at the present time.

With reference to the standard length of draw-bar, your committee, after a careful consideration of this subject, have decided to recommend two lengths of draw-bar, one of 30 in., to be used on all new cars to be built in the future, and one of 28 in., to be used where desired, but only in repairs of cars now in service. The establishment of this double standard will, it is believed, best meet the needs of the association.

Roads using the 28-in. bar and damaging a car with 30-in. bar to have the privilege of replacing the same with a 28-in. bar, using a 2-in. filling block at the rear end of the bar and increasing the length of pocket or tail pin, as the case may be. Cars on which 28-in. bar is used must have their couplers replaced with 28-in. bars.

In order that there may be absolute uniformity in the tail end of all M. C. B. couplers as they come from the foundry, your committee recommends the form shown on drawing.

On this drawing we also give the attachments by which this tail can be made to either receive the pocket or tail bolt.

It must be borne in mind that the important feature of the subject is the tail end of the coupler. The attachments are only given as guides or suggestions, as they may be varied to suit different requirements, without interfering with the interchangeability of the coupler.

In conclusion your committee respectfully submit for adoption by letter ballot the following standards:

First. That there be two lengths of draw-bars, one 30 in. and one 28 in., as shown on drawings, . . . the first to be used on all new cars, the second when desired on cars now in service, in the manner explained in the body of the report.

Second. That the neck of the draw-bar back of the head be 5 in. square.

Third. That the tail end of the coupler be as shown on drawing No. . . .

Fourth. That the open space in the carrier iron measure  $5\frac{1}{2}$  in. horizontally and  $5\frac{1}{4}$  in. vertically.

Respectfully submitted,

C. A. SCHROYER,

EDWARD B. WALL,

E. W. GRIEVES,

Committee.

After considerable discussion the following recommendations were, on motion of Mr. Wall, adopted for submission to the Association by letter ballot: 1. That the standard lengths of draw-bars be made 30 in.; 2. That 28 in. may be used on cars now in service, but that all new cars should be built with 30 in. draw-bars; 3. That the neck of the draw-bar back of the head be 5 in. square; 4. That the tail end of the coupler be as shown on the drawing submitted; 5. That the open space in the carrier iron measure  $5\frac{1}{2}$  in. horizontally and  $5\frac{1}{4}$  in. vertically.

A letter from the Inter-state Commerce Commission, asking the co-operation of the Association in investigating the subject of the use of safety appliances, was read, and, on motion of Mr. Rhodes, was referred to the Executive Committee for reply. Mr. Rhodes called attention to the fact that state commissioners had gone into questions of this sort without seeking the co-operation of the railroads; and that the action of the Inter-state Commerce Commission was commendable in the fact that they look to the officers of the railroads for information and assistance, and he hoped that the Executive Committee would give this letter very careful consideration.

Resolutions of thanks to the Delaware & Hudson Canal Co., the Mt. McGregor Railroad Co., the Fitchburg Railroad Co., and the People's Line of steamers for courtesies rendered were adopted; also to the management of Congress Hall and to the citizens of the village of Saratoga.

The Committee on Subjects suggested the following: Standard Journal Boxes for 40,000 and 60,000-lb. Cars; Best Metal for Brake Shoes; Ventilation of Steam Heated Cars; Joint Inspection; Uniform System of Inspection and Report of Car Seals; The Substitution of Steel Plates and Malleable Iron for Cast Iron in Car Construction, and the Lighting of Passenger Cars.

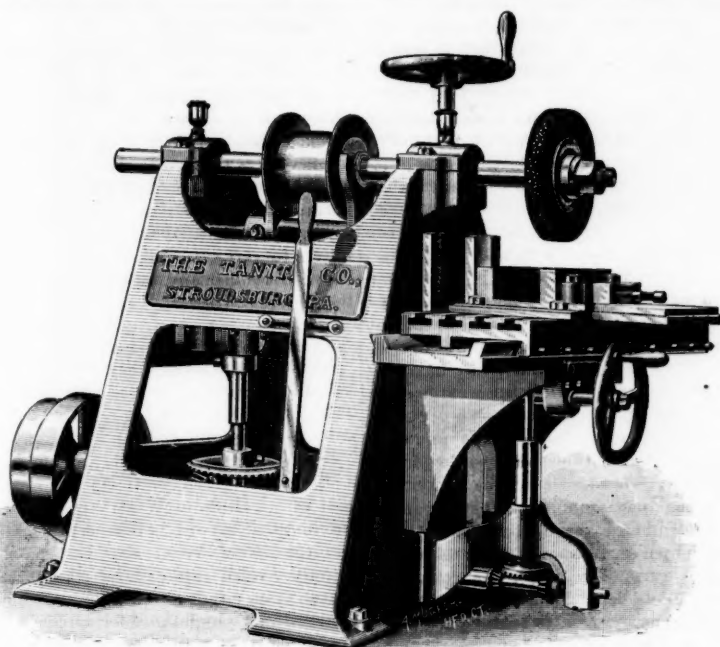
On a preliminary vote for the place of the next annual meeting out of 19 cities placed in nomination, the greatest number of votes were received by the three following: Charleston, 15; Chattanooga, 13; Buffalo, 11. By vote of the Convention the by-laws were suspended and Charleston was named as the place for the next annual meeting.

#### OFFICERS.

The following were elected for the following year: President William McWood, Grand Trunk; Vice-Presidents, C. A. Schroyer, Chicago & Northwestern; E. W. Grieves, Baltimore & Ohio; J. S. Lentz, Lehigh Valley; Treasurer, John Kirby, Lake Shore & Michigan Southern; Executive Committee, R. C. Blackall, Delaware & Hudson; E. Chamberlain, New York Central & Hudson River; F. D. Casanave, Pittsburgh, Fort Wayne & Chicago. The members of the Executive Committee who hold over are T. A. Bissell, New York Central Sleeping Car Co.; William Forsyth, Chicago, Burlington & Quincy, and J. W. Marden, Fitchburg.

The Convention was concluded by a very pleasant excursion made on Friday to Lake George. Something more than 400 people went on the excursion. A special train, provided by the Delaware & Hudson Canal Co., took the party to Lake George, and the steamers of the Lake Champlain Transportation Co. carried them around the lake and to the Sagamore, where a collation was provided. Captain R. W. Hunt presided at the collation, at which there were speeches by several distinguished guests. The party reached Saratoga about six o'clock in the evening, and shortly after Mr. R. W. C. Blackhall was presented by the members of the Association.





IMPROVED EMERY WHEEL PLANER.

tion with a gold watch and chain as a testimonial of their personal regard for him and of their appreciation of his efforts to promote their comfort during the Convention."

#### Improved Newman Emery Wheel Planer.

The illustration herewith shows the latest form of this machine, as manufactured by the Tanite Co., of Stroudsburg, Pa. The frame is one solid casting, with a wide base, thus standing very firmly. The carriage which formerly carried the emery wheel spindle is done away with, and the latter slides through its journal. For grinding flat surfaces rapidly this machine has proved very successful. The emery wheel revolves at a surface speed of about 5,500 ft. per minute, while it has a to-and-fro or traverse motion across the work, which latter is at the same time fed under it by the usual devices of a planer bed. The result of this compound motion is that the emery wheel cuts with great freedom and rapidity. It can be made to take a cut  $\frac{1}{4}$  of an inch deep; and it has been made to take a cut of  $\frac{1}{8}$  in. deep over a surface of 100 sq. in. in 6 minutes and 9 seconds. The ordinary cut is  $\frac{1}{32}$  to  $\frac{1}{16}$  in. These machines can be used on any flat surface, and are especially valuable for grinding chilled dies, such as are used for nuts, etc.

#### The Union Stone Co.'s No. 11 Grinder.

This machine is chiefly noticeable for the great distance between the wheels, 5 ft. 6 in., enabling two men to work at the same machine without interfering with each other. The grinder weighs 1,900 lbs. without the wheels, the counter shaft 400 lbs. It takes wheels 42 in. diameter by 5 in. thick. The main bearings are 9 in.  $\times$  2 $\frac{1}{2}$  in., the cone pulleys 10, 12 and 14 in. The fast and loose pulleys are 8  $\times$  10 in. and the cone pulleys are countershaft—20, 22 and 24 in. This grinder is made by the Union Stone Co., 38 Hawley street, Boston, Mass. The machine here shown was made for Messrs. Kelly & Jones, manufacturers of iron pipe and fittings, Greensburg, Pa. It is applicable for heavy work in railroad shops and foundries.

#### The Electric Motor Tests on the New York Elevated Railroad.

The American Institute of Electrical Engineers at its last meeting of the season, held June 25, again considered the subject of electrical traction, the paper presented by Mr. Leo Daft being based upon some recent electrical work on the elevated railroads and its bearing on the rapid transit problem.

He introduced the subject with a tribute to the efficiency of the elevated railroad system as it is now operated by steam, with special reference to that section of it known as the Ninth Avenue line, upon which his experiments with the electric motor have been conducted, over which passengers are now conveyed a distance of 5 miles in 26 min. for five cents, which he considered the best and cheapest municipal rapid transit in the world, and which is operated with a higher degree of safety than any other railroad in the world making an equal number of stops per 100 miles. On a recent holiday, April 30 last, 835,720 passengers were carried upon the entire system without noticeable detention or accident. The rapidly increasing traffic makes the demand for better facilities a pressing one, and as the average half million now carried daily will soon become a million, it appears doubtful if any method can be devised of providing for the growth by the use of steam motors on the present structures, which are now taxed to their utmost. To the mind of the mechanical engineer, having in view the ordinary co-efficients of tractive ability there is no remedy for this. The speaker stated that these co-efficients were not entirely trustworthy. He reiterated his previously expressed opinion, based on frequent experiments, that there is a decided increase in traction

gained by the passage of the electric current from the wheels to the rails, giving the details of one test where a motor with a load making a total of 600 lbs. climbed a gradient of 2,900 ft. per mile, starting from a state of rest. He stated that some of those people who had ridiculed his statements had finally admitted that they were true.

The motor "Ben Franklin," which had been used in making these tests on the elevated roads, weighed 10 tons, and performed service nearly equal to the steam motors weighing 18 tons. The object of these tests was the determination of coal economy. Tests with a Prony brake showed that the motor developed 128 H. P. The piece of track on which the experiments were conducted embraced 2,200 ft. of level track, and  $1\frac{1}{2}$  miles of gradients, varying from  $11\frac{1}{10}$  to  $98\frac{7}{10}$  ft. per mile, while at Thirtieth street the station is at the foot of the steepest grade, thus testing to the utmost the tractive capacity of the motor. The experiments were begun in October, 1888, and carried on between the hours of 9 p. m. and 4 a. m., beginning with one or two cars, the load being increased nightly until it was finally made up of eight coaches of 12 tons each, which were hauled up the 98-ft. grade at a speed of  $7\frac{1}{2}$  miles per hour, the entire distance being covered at the rate of  $14\frac{1}{10}$  miles per hour. The maximum speed obtained on level with that train was 16.36 miles per hour. Seventy trips were subsequently made with a 70-ton train operated between the steam trains under 3 minutes headway, but the work was considered too critical on account of the absence of suitable brakes. A number of experiments made about this time showed that the mean-speed with a three-car train running express on the up-town track was about 24 miles per hour, although the ability of the motor on a level with a similar train was nearly 28 miles per hour. This, however, was not the maximum speed, as the level track was not long enough to permit of its attaining the highest rate. It was the opinion of the speaker, how-

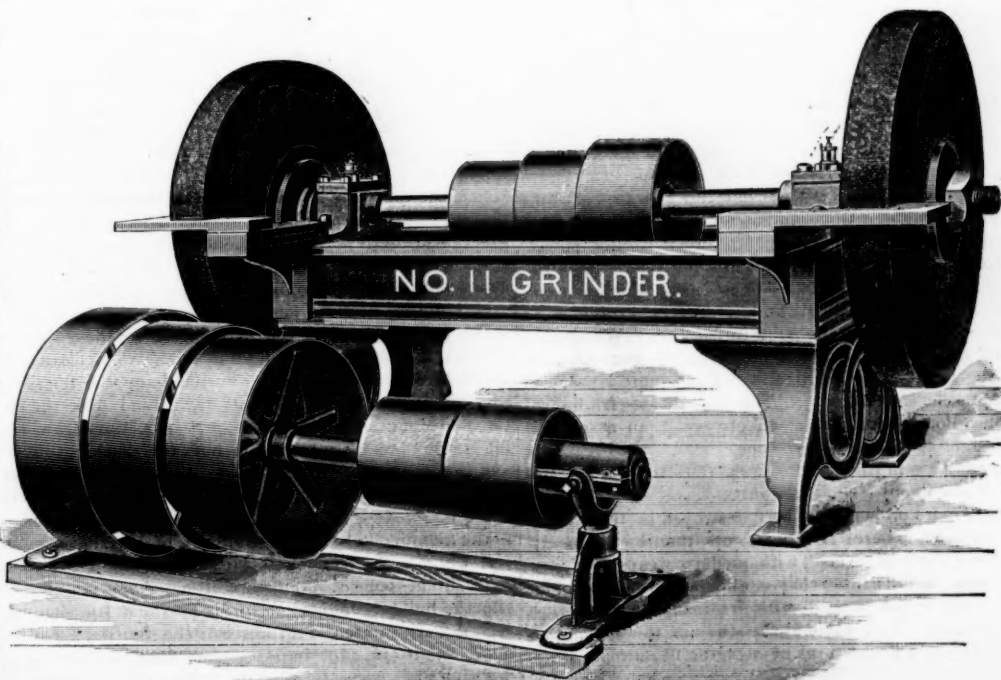
ever, that the speed attained could not be exceeded with prudence on the elevated structure.

The measurements of speed were made by dividing the track into 19 sections of 500 ft., each section being provided with a circuit closing plate connected with a chronograph which was carefully tested. The indicator cards were taken at the central station by Mr. Idell and his assistants, and the dynamometer used was of the liquid type made by Mr. Shaw, of Philadelphia. The diagrams prepared from the data obtained were then explained by the speaker, who stated that there was not a marked difference between the 10-ton motor and the 18-ton locomotive in the initial effort on the level, as will be seen by comparing a run observed by a railroad officer on March 9 with a steam motor and a load of about  $57\frac{1}{4}$  tons. The steam motor required 1 min. and 29 sec. to make the distance from 14th to 23d streets while the electric motor with a train of 70 tons made the same trip in 1 min. and 50 sec.; the absence of power brakes compelled the current to be taken off at 19th street, while it was probable that the throttle of the steam locomotive was not closed until it reached 23d street, this being the usual practice. The data obtained in these experiments shows that 29,940 h. p. is required to operate the Ninth Avenue railroad for the 16 hours' service, or an average of 1,871 h. p. per hour, or 2,181 h. p., adding station friction. The varying requirements of the traffic during the day shows that the service could be advantageously divided up between four stationary engines of 800 h. p. each, there being but five hours of the day when all of them would be required. The fuel consumption per day allowing 22 lbs. of coal per h. p. per hour at \$2.25 per ton, would make a total of \$92.25 per diem for fuel, the coal being a mixture deliverable at the dock for about \$1.80 per ton. The weight of coal used for the present locomotives is about the same, viz., 40 tons per day, but practice has shown it to be most economical to use coal of the best quality, costing \$5 per ton, making the cost of fuel about double that required for the electric system. Without entering into other economies which the speaker claimed were in favor of electricity, and ignoring the plan suggested by Sir William Siemens of braking the train by converting the motor into a dynamo and thus utilizing the energy of momentum, he believed that the economy in fuel alone was sufficient to prove that the application of power by electricity was preferable to direct steam propulsion for the elevated railroad service.

#### Enlarging Locomotive and Car Works.

Burnham, Parry, Williams & Co., of the Baldwin Locomotive Works, are about to erect at the southwest corner of Fifteenth and Spring Garden streets, Philadelphia, two large buildings as an addition to the present works. The pattern storage building will be six stories high, with a front on Spring Garden street of 80 ft. and a depth of 80 ft. Connecting with this, on Fifteenth street, and running south 138 ft., with a width of 34 ft., is to be a one-story sand and oil house. The archways, windows and base course will be of cut stone. The fronts of the buildings will be of brick and corresponding in appearance with the Broad street buildings. Both buildings will contain vaults and cellars, the roofs of which will be covered with asphalt paving blocks and the floors with concrete. All the inside doors are to be made fire-proof. A hydraulic freight elevator of Stokes & Parrish build, with a capacity of not less than 8,000 lbs., will be located in the pattern storage building. Jacob Garber is the contractor, and the work is to be finished by Oct. 1, next. The improvement will cost about \$75,000.

The Burton Stock Car Co. has purchased a tract of six acres of land located between Forty-seventh and Forty-eighth streets, Chicago, adjacent to the tracks of the Union Stock Yards & Transit Co. and the Chicago, Rock Island & Pacific and Chicago & Grand Trunk railroads, and is laying tracks upon the same, and also preparing to erect a shop 180  $\times$  280 ft. for the construction and repairs of its cars.



THE UNION STONE CO'S NO. 11 GRINDER.



Published Every Friday,  
At 73 Broadway, New York.

#### EDITORIAL ANNOUNCEMENTS.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

The drawings prepared by the Master Car-Builders Committee to accompany the report on standard brake rigging are given in full in this issue of the *Railroad Gazette*, together with extracts from the report published last week, referring particularly to the drawings. The recommendations which are to be submitted to letter ballot are also reprinted. It is expected that the report of the Convention will be distributed before the ballots are sent out, and the drawings will thus be placed in the hands of the members of the Association; but there are many others than the members who are interested in the details of the proposed change, and must decide upon them. Generally speaking, the only objection to the standards recommended will be the increased cost. That they are all calculated to increase the efficiency of the air brake, to facilitate repairs on interchange cars and to promote economy of maintenance no one can doubt. It remains for each road to decide whether the greater first cost of the improved gear will be more than offset by these gains. Those who are prepared to consider the subject at all should not fail to read the report carefully. The arguments are there presented so fully and so clearly that nothing more need be said now.

The Delagoa Bay railroad war is not a large one, but it presents several interesting features. Some four years ago Portugal granted a charter to an Anglo-American company authorizing it to build a railroad 58 miles long, connecting Delagoa, in Portuguese Africa, with the Transvaal gold fields. Fifty-four miles were completed more than a year ago, and have been open for traffic ever since; but the remaining four miles lay in an extremely difficult country, and could not be finished within the time limit contemplated by the charter. On this account the Portuguese Government declared the concession forfeited, and apparently attempted to take possession of the road without regard for the rights of the company. But this was not so easy. England took the matter seriously, and promptly arranged to send a gunboat to the point threatened. We seemed to be on the eve of a railroad war between England and Portugal. But more peaceful counsels prevailed. The gunboat frightened the Portuguese more effectively than a general freight agent could have done. This is not because a gunboat is in itself more dangerous than a general freight agent. On the contrary, we are convinced that more property has been destroyed in the last ten years by general freight agents than by gunboats. But a gunboat, armed with modern weapons of precision, usually hits what it aims at, while a general freight agent, armed with irresponsible authority, does not. We commend the study of this distinction to presidents who think of engaging in railroad wars.

The Committee of the Master Mechanics' Association apparently see little need for anti-magnetic shields

for protecting the watches of enginemen from magnetic influences while on their engines, believing that watches are not affected by the magnetism of iron in the engine and track to a degree sufficient to be worthy of notice. For the same reason they would doubtless regard a non-magnetic watch as something the railroad company has but little interest in. But nevertheless they think there is a real danger from proximity to dynamos and other electrical structures when off duty, and they therefore believe in protection of the men's watches. They lay the main stress on the necessity of taking good care of watches, but they do not say what amount of variation would be compatible with their idea of an accurate time-piece, and we therefore have no light on the degree of carefulness that they deem necessary. The point made by the advocates of protection is that without it a watch will be reliable at one time and not at another (under the same care), and that it may run uniformly with a variation of, say, 30 seconds a month for a while and then suddenly show larger fluctuations. But as the Master Mechanics do not say whether 30 seconds a month, a week or a day is the maximum allowable variation, according to their standard, the opposing arguments cannot be fairly compared. But if stress is to be laid upon taking good care of watches, the reasoning should be carried to its logical conclusion, and this duty be demanded of two men, or rather with two time-pieces. Every one must acknowledge that the best of watches may unexpectedly stop and that this possibility involves danger in running a train: every train movement, therefore, in which an error in time would introduce the risk of a collision, should be made only after consulting two time-pieces. This safeguard is nominally provided by the rule throwing equal responsibility upon conductor and engineer, but this rule is one that is not strictly enforced and one whose enforcement is difficult to secure. The rule requiring engineers to acquaint their firemen with each telegraphic order is agreed by progressive superintendents to be a good one; why not supplement it with one requiring firemen to carry a good watch? One of the reasons for making firemen take thought of the telegraphic orders is the training thereby afforded to future engineers; in this view they ought to be consulted about time-table movements as well as those made on special orders.

Now that the smoke of the Oregon Transcontinental battle is clearing away, the field and the results can be better seen. It is apparent that the point most insisted upon by the Villard party was that the rental of 6 per cent. upon the Railway & Navigation stock to be paid by the Union Pacific, should not be reduced, of which they anticipated the danger should that company secure the control. This dividend the Oregon Railway & Navigation Co. has not earned. In 1888 the Union Pacific advanced \$350,000 to cover the rental deficiency. It would, however, be a serious error to consider this deficit as the measure of the value of the Oregon Railway & Navigation lines to the Union Pacific, since the interchange traffic over the Oregon Short Line netted the Union Pacific probably over half a million dollars. In view of this and of the future prospects for traffic from Oregon and Washington it can hardly be said that this guarantee of 6 per cent. will prove too heavy a burden. Well informed railroad men are agreed that no section of our newer country has so bright a future as the region watered by the Columbia River and its tributaries. Oregon and Washington will one day support a large population, and even now give to the railroads a fair tonnage. It is apparent that here as in other states, the railroads, in their haste to possess the land, might build lines far beyond present needs, entailing great losses until population should overtake the mileage. It is, therefore, cause for congratulation that the Transcontinental compromise will allow only of necessary building under a joint occupancy by competing roads. In these states the Northern Pacific has the better strategic position. By its joint arrangements over the O. R. & N. lines it reaches Portland and the territory tributary thereto. By its own road over the Cascade Mountains it reaches the Sound, thus drawing traffic to its main line from both the Washington and Oregon slopes. By its lease of the O. R. & N. lines the Union Pacific has access to Portland and West Washington on the one hand, and on the other to the farming and mining countries of the Palouse and Colville, Spokane and Coeur d'Alene. The St. Paul, Minneapolis & Manitoba will make no present effort to build its connection to the Pacific if trackage facilities are secured to it; nor can the Seattle, Lake Shore & Eastern, now building east from Seattle to Spokane Falls, prove a disturbing factor. If the greater part of this present and prospective traffic can be carried over the Oregon Railway & Navigation lines impar-

tially, the future of that property ought to be assured. The people of Portland and of the states named were opposed to this policy. Naturally they are selfishly anxious for as many lines of railroad as possible, and all strongly competitive. They are shippers of freight and not to any great degree owners of bonds and stock. But the policy of building roads only as they are needed is so clearly right, and the advantages to all the Pacific roads from the ability to reach all important competitive points at the minimum of expense so apparent, that it would be a financial crime if a failure to agree should be allowed for some years to come to compel any unnecessary railroad building in the Pacific Northwest.

Serious train accidents, serious both in extent of human suffering and of damages to property, and also as regards the causes, are reported from Connecticut, Ohio and Virginia during the past week, following close on one in Pennsylvania and one in West Virginia a short time previously. On the Pittsburgh, Cincinnati & St. Louis in West Virginia a fast mail train was derailed, according to reports, by reckless running; on the New York, New Haven & Hartford a heavily loaded fast express was ditched near New Haven from either a fallen brake beam or a poorly fastened rail which the track repairers had just put in. On the Norfolk & Western a washout is said to have caused the death of over 20 passengers and trainmen. A freight collision on the Pennsylvania near Latrobe, Pa., killed at least ten persons, and reports of a larger number of trespassing passengers being buried in the wreck remain unconfirmed. While leaving more particular details of these accidents for our regular monthly record, we note just here the great need of an impartial and intelligent investigating board to get and publish the whole truth about such important occurrences as these. Nothing is plainer than the fact that mere financial responsibility does not in all cases produce the requisite cautiousness in caring for human life on the part of railroad companies. Coroners and other local authorities often have the best intentions and occasionally do good work, but there is no depending upon them. A recent collision in Connecticut was investigated by a coroner, but no clear account of it has been published. In the derailment near New Haven, just referred to, the coroner *thinks* that the track repairers renewed some rails too hastily, but no evidence is adduced, and there seems to be no prospect of a searching inquiry by experts. The states named are in need of good railroad commissions. Connecticut and Ohio have commissions, but there are no technical experts upon them, and it does not appear that public opinion distinctly demands or the public treasury clearly authorizes extensive investigations of the kind needed. The Pennsylvania and the New York, New Haven & Hartford rank as first class roads, but that should rather lead them to favor impartial investigations than otherwise. A road whose officers have taken all proper precautions and yet is overtaken by disaster should welcome the verdict of an independent tribunal as a vindication. For the public to be shut up to the story of a coroner that trackmen are careless, and the claim of the officers of the road that a brake-beam dropped, with the choice of believing whichever its prejudice or inclination may dictate, is discreditable both to the road and the state.

#### Guarantee of Car Wheels.

The service guarantee of chilled wheels which the Master Car-Builders' Committee has drawn up, and which is to be submitted to the Association for adoption as standard, leaves, when taken with the specifications, little to be desired. We have held that a service guarantee should not be allowed to take the place of rigorous specifications and tests, principally for the reason that the last place in the world to test a wheel should be under a car. This view of the matter is set forth at some length in the communication from C. printed in another column. This communication, by the way, was in type before the convention met, and C. had no knowledge what the committee's report would be. He merely expresses the conclusions which he had come to in years of service as a mechanical officer on one of the trunk lines. The proposed specifications and tests do away with C.'s objections to buying "a pig in a poke."

There are other objections to the guarantee system which we have pointed out before, and which are obvious to all. Theoretically, it is just to both parties, but practically it has difficulties. The conditions of service are so different on different roads that what would be a long life for a wheel on one road would be a short life on another, and the



rate of mileage credit should vary according to the different conditions. With cars that are freely interchanged the average might be pretty nearly fair, and in any case this difficulty may not be as serious as it seems. The guarantee system involves an elaborate and extensive system of accounts, and usually leads to the accumulation of wheels in the yards where they must be held until they can be inspected and their records closed.

All of these objections, however, are trifling, if under the system a railroad company can increase its wheel service 60 per cent., and if the wheel makers can find a substantial profit in increasing the durability of their wheels. Those are precisely the results that the committee anticipates from the guarantee proposed.

The adjustment of the method and rates of payments follows closely the suggestions made by Mr. W. W. Snow, in a paper read before the New England Railroad Club, in February, 1885, and is identically that agreed upon in May of that year by the joint committee of the Wheel Makers', Master Mechanics' and Master Car-Builders' associations. It is well calculated to serve the interests of the railroad companies and of the makers of good wheels, and cannot very well be perverted to the uses of the makers of bad wheels. By this system the railroad is committed to pay for a new wheel only its value as scrap, even if it passes the inspector and stands the tests. That is, the maker is debited 55 per cent. of the price of the wheel, and the experience of many years shows that the scrap value of a wheel is very nearly 45 per cent. of its first cost. Therefore nothing is to be paid for the wheel till it earns something. This 45 per cent. of the agreed first price of the wheel is the only constant quantity. The rest of its cost to the buyer depends entirely upon the mileage made, and the more miles the constant is distributed over, the less the cost of the wheel per mile run and the greater the price received by the maker.

Under the form of guarantee proposed last year the credit for service ceased when the limit of the guarantee was reached. This arrangement makes it possible for the roads to get their wheels for less per mile run than that now proposed, but does not insure to the maker proper payment for the most durable wheel. As the committee says, it defeats the purposes of the guarantee. On the whole the form of specifications and guarantee now proposed, which is the outcome of long and careful consideration, by representatives of all interests, is worth a careful trial. It promises to correct many abuses and to produce valuable results.

#### Prussian Railroad Management.

The art of government administration is better understood in Prussia than anywhere else in the world. This makes it worth while to study Prussian methods of railroad organization for two reasons. In the first place, we see an intelligent and skilful effort to avoid some of the dangers of government action. In the second place, we see where it has been found impossible to escape these dangers wholly. A recent article by Dr. v.d. Leyen, in the *Zeitschrift für Eisenbahnen und Dampfschiffahrt*, furnishes full illustration of both these aspects of government control.

The Prussian railroad system, in its present form, is of comparatively recent origin. Ten years ago the government managed less than half of the railroads in the country, and actually owned only a part of those which it managed. Under these circumstances it was simply one corporation among many. The government railroad policy was effected and often absolutely determined by the independent action of private competitors. It could not pursue remote objects of national development in the face of temporary commercial loss, because the public was unwilling that government railroads should show a deficit while private owners made a profit. To secure independence of action, the government was forced to own not merely a part of the lines but all of them. It required a monopoly independent of outside competition. In the year 1879 it began to buy up the private railroads, and in the course of a few years came into possession of all the important ones.

Having the railroads in its hands, it did not commit the fundamental mistake made by most governments. It did not adopt the policy of centralization such as would be carried out without hesitation in America or Russia. It saw the necessity of giving free play to separate organizations and separate local bodies. It did not try to regulate everything from Berlin as the French railroads are regulated from Paris. It devised a kind of Federal government of railroads, curiously like the political system of the United States. It divided the railroads of the country into a number of *Directionen*, or independent systems; each of these

in turn being subdivided into several *Betriebsämter*, or divisions. The separate systems were, for the most part, between one and two thousand miles in length, while the largest of them all included but 2,500 miles. They were given the utmost measure of independence. Only certain general rights of control and management were reserved for the central office at Berlin. Each system is under the immediate charge of a president, who is the responsible head of the whole. Under him are a financial department, a construction department and a combined traffic and operating department. All matters of general policy are controlled by the system as a unit, the divisions dealing with details of operation. The matters reserved for the decision of the central government at Berlin relate chiefly to the building of new lines, the opening and closing of sections of line, the agreements as to payment between one system and another, and the more general questions of time-tables, especially for mail trains. More general matters of policy with regard to rates also require, in the last resort, decision by the central government. The government control is exercised through the ministry of public works, one department dealing with technical or engineering matters, and another with administrative questions of various kinds.

Although the separate systems go by the name of "*Directionen*," their organization has very little in common with that of our boards of directors. It is only occasionally that the heads of the different departments meet one another for the decision of questions of common interest. The effort has been to give as much administrative independence and individual responsibility as possible; and this effort seems to have been attended with a high measure of success.

Nearly every system has its advisory board, composed of persons not immediately connected with the railroad itself, but representing different commercial and technical interests. It is expected that this board will make suggestions as to changes in rates and facilities, and that it will act as a representative of those who use the roads for the information of those who manage them. It is a question just how far this arrangement has been successful. The article under consideration speaks in unqualified praise of its workings, but this article was written by a prominent member of the Prussian railroad administration, and takes a most rose-colored view of everything. In many instances, at any rate, the operations of the advisory board are so slow as to be of little value.

In spite of all these efforts to avoid centralization, the natural tendency of government control toward too great uniformity asserts itself even in Prussia. We are told that it is a principle of the Prussian system to have equality of prices for everybody. As an example of this, it is said that passenger tariffs are arranged on an equal mileage basis with the same fundamental unit in almost the whole country, and that pretty nearly the same result has been reached in freight business. This fact, which is urged in praise of the Prussian administration, is really a most severe condemnation. If the unit of rate is placed high enough to cover the cost in the less thickly settled districts gross injustice must be done to the more populous ones. Nor is this all. If the rates in thickly settled districts are not reduced the government does injustice to itself as well as to the people in those districts. It prevents a development of traffic in a district which can furnish it, simply because traffic cannot be similarly developed somewhere else. It is communism in the worst form; the enforced reduction of the strongest to the measure of efficiency of the weakest. If, on the other hand, the unit of rate is calculated on the basis of a more populous district, and no section of country is allowed to have a railroad which cannot pay for it on those terms, the development of certain regions is checked. The very weakest region is hurt by this means as much as the very strongest is hurt by the other. Nor can the policy of the Prussian government with regard to local railroads, wise as it is in many particulars, wholly counteract the effects of this tendency. The small per capita train service of Prussia is an indication that development and progress have been sacrificed in the effort for uniformity. We do not deny that many good results have been achieved. There is more publicity of rates in Prussia than in any other highly developed country, and, on the whole, much more real equality of treatment; but the good has not been obtained without most serious disadvantages. The practical working of this uniformity is shown by the fact that many, even among those who control the government railroads, desire the development of a system of canals as supplementary to it. There are, of course, a few instances where exceptionally good canals can compete successfully with railroads. But a railroad man who should say that he wanted an

ordinary canal built because an ordinary canal could handle advantageously certain kinds of traffic which the railroad could not, would in America be laughed at. The fact seems to be that the German railroads are so tied up by standards and uniformity that they cannot do their work on a large scale to advantage, and that therefore they have to have the help of canals. A canal, obviously, can carry a great deal of traffic which a railroad cannot if that railroad is confined to backwoods rates. We believe that this is practically the situation in Germany. Not that the German rates are high as compared with those in some other countries, but that the artificial standard of uniformity prevents them from developing in a way which the necessities of business demand.

The same uniform level of mediocrity is seen in the low standard of efficiency in railroad operation. Dr. v. d. Leyen points with pride to the fact that the Prussian railroad system has begun to introduce automatic brakes, and that now 961 locomotives and 4,316 passenger cars have been provided with air brakes, as if the smallness of these figures were not the severest condemnation of Prussian enterprise. Perhaps he would reply that the Prussian railroad trains go so slow as not to need air brakes. This would be at least partially true, but the excuse would simply make matters worse.

We have looked with interest to see what the writer would find to praise in connection with Prussian train speed. His words are worth quoting. "The time tables of the state railroads show quite noticeable improvements. The number of trains has been increased and their movement hastened, while the introduction of new and specially fast trains between large trade centres is likely to follow in the immediate future." Of this sentence we can only say that it shows how little even the best government officials can be trusted to report on their own performances. Any considerable American railroad system which should have shown so little progress in these respects as have the Prussian government railroads during the last ten years would be a by-word and a laughing stock. Of the standard that has been actually attained let one instance suffice: an instance which will impress itself on the American who first lands in Germany from the ships of the North German-Lloyd Steamship Co. A single main line of railroad communication runs due south from Bremen toward Frankfurt. It is the only important north and south line in that part of the country. From Bremen to Göttingen, where lines diverge toward various parts of central Germany, is a distance of 142 miles. There is one night train—without sleeping cars—which performs the journey in five hours. In the day time it takes more than six hours by the best train, and in general over seven. And yet we have heard Prussians speak of the advantages of a government railroad system in enabling the different parts to arrange their time tables so as to make good connections with one another.

The article before us speaks of the universal acquiescence in government railroad management. We all know why the Dutchman's wife was resigned at the approach of death—she had to be. Perhaps the universal acquiescence is somewhat after the same fashion.

#### The Traffic of the Union Pacific.

The Union Pacific is one of the largest transcontinental carriers. With its connection with the Central Pacific it was the first line opened to the Pacific Coast, and it has always maintained the lead thus given it. Of all the tonnage called transcontinental between the Pacific slope and Eastern points, the Union Pacific carries between 40 and 50 per cent. In addition to this it has a local traffic which is greater than its through tonnage, and though on the latter it charges scarcely more than its proportion per ton per mile on California traffic, yet the two kinds enable it to transact its business with good economy. A comparison with its Pacific neighbors, north and south, is interesting.\*

These comparisons should not be pushed too far, but they show some instructive facts. The density of traffic and favorable conditions upon the Union Pacific enable its average freight train to carry nine more cars and sixty-eight more tons than upon the Pacific system of the Southern Pacific. Under such economic possibilities, the charge of this latter company of a cent and a half per ton per mile on local traffic more than the Union Pacific is a very moderate advance.

Turning to the Northern Pacific, the comparatively light through traffic is responsible for the uneconomical train-load. A curious study is suggested by the items of interest and earnings per mile. How did these come to bear so close a relationship to each other? It is a well-known saying of traffic men that as soon as they build up the business of a road so that its earnings are beyond the average, the directors equalize the earnings by an issue of bonds or stock.

\* The figures for the Union Pacific include only the road owned, viz., the two main lines and the Leavenworth and Cheyenne branches, this making the fairest comparison with the other roads.



ROADS.	Average miles operated.	Interest on bonds per mile operated.	Earnings per mile.	Expenses per mile.	Net earnings per mile.	Freight mileage.	Millions of ton-miles.		Rates per ton per mile.		Av. number cars per freight train.	Average freight train load, tons.	Average haul, miles.
							Through.	Local.	Through.	Local.			
Northern Pacific.....	3,219	\$1,461	\$4,922	\$2,494	\$1,953	5,427,221	125.46	531.29	Cts. 0.83	Cts. 1.04	26	130	271
Union Pacific.....	1,824	2,773	10,911	6,450	4,432	6,469,541	487.91	643.76	1.26	1.28	24	188	208
Southern Pacific Co., Pacific System.....	3,781	2,006	8,636	5,575	3,051	8,936,661	568.01	422.76	1.21	2.75	14½	120	219

However that may be, the relation between net earnings and interest is regulated by laws as subtle in their workings as those of supply and demand. This table also disproves the popular idea that the traffic of the Pacific roads is mostly through; the reverse is the truth with the Northern and Union. The comparatively small local business of the Southern Pacific explains why that road is peculiarly restless under Canadian competition.

But there are clouds upon the Union Pacific horizon. Its old-time monopoly of through and local traffic is constantly being encroached upon. It is probable that future years will show a decrease of competitive California tonnage. Its rivals have built lines past Omaha to the Rocky Mountains. The Burlington now delivers much of its transcontinental traffic to the Union Pacific at Cheyenne, and, because of its Denver line, the Rock Island is not now delivering all its through business at Omaha, but is carrying a good part of it to the junction near Denver. In both these cases the Union Pacific loses 500 miles haul. In return, it must also turn over to these two companies, at the places named, a proportion of its East-bound tonnage, instead of carrying over its entire road to Omaha. This arrangement is forced upon it by the competition of the Denver & Rio Grande, which is willing to pro-rate with the Missouri Pacific, Rock Island, Santa Fe and Burlington for Salt Lake City and Ogden, as well as the Pacific Coast. These diversions, from the whole line of the Union Pacific, must in the future reduce the distance of the average shipment and the consequent profit of the average freight train. If men closely interested are to be believed, the Central Pacific has in mind the possibility of an extension of its line from Ogden to Denver, by purchase or affiliation; especially if any lines should be built by the Union Pacific into Southern California.

Of the two roads now connecting with the Union Pacific at Omaha only, the Northwestern cannot be permanently relied upon for a good connection. Just what the Northwestern plans are has not transpired, but with the return of prosperous times it may be considered certain that it will have a good Pacific connection for its outstretched lines. This leaves the Chicago, Milwaukee & St. Paul as the only sure friend, and a closer alliance with this road in the future is more than probable.

These possible future losses in through California traffic have led the Union Pacific to turn its eyes northward. If good judges are to be believed, Oregon and Washington are states of more promise as to railroad traffic than any others west of the Rocky Mountains. Splendid harbors and rivers, diversified products from the farms, forests and mines will yield largely for transportation. The Northern Pacific has the first advantage here, but the Union is not far behind, and the future looks bright for both roads. The possible losses on California traffic may before long be more than made up to the Union Pacific by this hoped-for increase from the Oregon region through the Short Line.

In this connection the value of local feeders becomes apparent. The situation sustains the opinion, advanced during the governmental investigation two years ago, that the Union Pacific branches were all important to it. Not only are there competing main lines on all sides of the Union Pacific, but what was once thought to be local territory tributary strictly to it is now cut into by branches of these other systems. What the Union Pacific branches did for it in 1886, according to its auditor's report, is as follows:

Statement Showing Value of all Branch Lines.	
Net income after deducting deficits.....	\$1,446,123
Value of interchange traffic to U. P. main line.....	3,277,070
Total direct and indirect income.....	\$4,723,194
Interest on bonds outstanding.....	1,080,465
Balance of surplus to Union Pacific.....	\$3,642,729

This surplus is reached by assuming that of this traffic from the branches to the Union Pacific main lines 60 per cent. is profit, for the reason that of all the traffic it is the cheapest to the main lines, and costs even less than 40 per cent. to handle.

These figures of profit to the main line, we think, are too large. To be correct, these profits should be debited with the additional expenses to the main line in the way of terminal facilities, equipment, etc., made necessary by this branch line traffic. But after this is done, the amount of earnings to the Union Pacific main line is still very large and the importance of feeders beyond question. The company is trying to get its auxiliary lines into compact shape by consolidating them into strong corporations, but finds itself much hampered in arranging for this and for further extensions into developing territory, by the failure of Congress to provide a reasonable measure of relief and settlement for the debt due the government with the consequent removal of irksome restrictions which bind the Union Pacific but not its competitors.

#### Chicago-St. Paul Rates.

The tariff sheet, by means of which the Chicago-St. Paul roads hope to escape from their dilemma, is a transportation

curiosity. It will be remembered that the Chicago merchants threatened the roads with prosecution for unjust discrimination if they continued to charge 60 cents local from Chicago to St. Paul, while continuing to accept 28 cents as a proportion of the through rate. To please these merchants, the roads propose to abrogate this pro-rating and to apply upon all this traffic, whether through or local, the same tariffs. The Chicago merchants profess themselves satisfied with the arrangement proposed.

The curious part of the affair is this commodity sheet. The local class rates between Chicago and St. Paul remain as before:

	1.	2.	3.	4.
	60c.	50c.	40c.	25c.
The rate of course are to be charged upon all less than carloads.				
The commodity tariff taking effect July 5 names low rates upon carloads only and even upon articles which rarely are given any but class rates. The following are instances from this special tariff, Chicago to St. Paul:				

	Cents.		Cents.
Boots, shoes and rubbers, min. 10,000 lbs.....	25	Hats and caps, min. 10,000 lbs.....	25
Canned goods.....	10	Nuts, edible.....	20
Cotton piece goods, min. 18,000 lbs.....	25	Oatmeal.....	12½
Dry goods and clothing, min. 15,000 lbs.....	25	Prunes.....	15
		Sugar.....	10

It will be noticed that these carload rates are a little below the former proportion of through rates. Now, no Chicago jobber, and, indeed, very few merchants of any class in that city, can sell at one time to any one, whether retailer or jobber, in St. Paul, so much as a carload of drygoods, or boots and shoes, or hats and caps. The larger dealers in the Northwest do purchase these articles in large quantities at certain seasons of the year, but usually buy of manufacturers or their agents at the seaboard. Hence, these commodity rates for carloads can generally be taken advantage of only on through shipments from the East to St. Paul. It is, therefore, difficult to see wherein the Chicago jobbers have been in the least benefited by this commodity tariff for large quantities, with which they profess themselves pleased. As to small lots from the seaboard to St. Paul, these can go via the lakes or via the "Soo Line" at the same rates as to Chicago, and even lower. The charge of 60 cents first class, north of Chicago, cannot stop such package freight, except to turn it away from the Chicago roads.

By a very clever piece of work the railroad men have apparently yielded to the public demand for stoppage of the great discrepancy between a local and the proportion of a through rate, while at the same time they have fixed the tariffs so as to secure some share of the traffic north, which moves at times in large quantities. But such an arrangement at the best is only a makeshift and cannot be a permanent solution of the problem. Suppose that public sentiment at the West should demand that there should be little or no difference between local and proportion of through, and that in consequence the Chicago-St. Paul roads should be compelled to go out of the traffic between St. Paul, Minneapolis and the seaboard; how would the Chicago merchants gain by it? The traffic would move to and from the Northwest as before, but the Chicago roads, losing that much extra revenue, would feel like charging higher locals rather than lower. The attitude of Chicago is natural but unreasoning.

Australian railroads, whose traffic and characteristics are the subject of an article in another column, are not likely ever to have such a development as those of the United States, where the vast extent of the country of itself greatly increases traffic. That is, a line from New York to Pittsburgh carries traffic not only from the country along the 444 miles of its own length, but from that on the 498 miles of line from Pittsburgh to Chicago; and the line from Chicago to New York, besides the traffic from its own territory, carries that from lines from Chicago to Omaha, etc.; and the line from Omaha to New York from the country on the line from Omaha to Cheyenne, etc. Australia is a very large island, but it is a small continent and it is impossible to get more than 700 or 800 miles away from the sea in it. At present, the population in the interior is very small, and consequently the existing railroads generally extend from some port only two or three hundred miles inland, and there is nothing comparable to our "trunk lines"—no main stem which conveys to the seaboard the traffic of a great system of railroads and of a vast territory. Their situation is something like that of our Southern railroads before the war, and, indeed, to a considerable extent afterwards, where, though they had connections with other roads forming long lines and great systems, for the most part their traffic was limited to carrying traffic from the sea inland not more than 300 miles, and to the sea from similar distances. The development of the interior of Australia will, of course, change this, and the country is still in its infancy; but this interior is not large enough to afford the vast traffic which burdens such lines as those from Chicago to New York, etc. Probably one result will be that would-be trunk lines will not be multi-

plied, which is all the more probable because the roads are built and worked by the colonial governments.

Another reason why a great concentration of traffic on a single line is not likely to occur is that there is no one port of overwhelming importance, like New York, which distributes the larger part of the imports for the whole country, including such seaboard cities as New Orleans and San Francisco. In Australia, Melbourne, Sydney, Adelaide and Brisbane are ports for limited territories rather than for Australia at large. This, however, may not always be so. Improvement in the communications between one port and another, and one colony and another, may in time result in the development of one great Australian metropolis, whose frequent and regular communication with the rest of the world and large and varied stock of merchandise may cause it to do most of the importing and some of the exporting for other Australian seaboard cities, even if distant from them.

An Omaha dispatch of June 27 states that the engineers and firemen of the Leavenworth Division of the Union Pacific, who lately protested against a reduction of wages, agreed with the company upon a board of arbitration, and that this board rendered a decision in favor of the engineers. It holds that the taking of the Kansas Central out of the management of the Union Pacific did not abrogate the agreement under which the engineers and firemen were being paid at that time. "The executive officers of the Union Pacific system recognized the Brotherhood in fixing the schedule of wages of the Oregon Railway & Navigation Co., which was and is part of the Union Pacific system, taking effect March 1, 1889, and they should have recognized them and consulted them before changing the wages on the Leavenworth division, which is part of the Union Pacific system." Manager Baldwin says the decision is final, and that the wages will be restored, dating back from May 15, the time of the reduction. The names of the arbitrators are not given, but a local merchant was one of them.

In the July Century there is an open letter on the decline of the editorial in our great daily papers. After saying that editorial have not the influence of twenty years ago and that there must be a change in method, the Century writer pleads for editorial writing based upon real knowledge of the matter discussed, and instances the longshoreman's strike not long ago, upon which no daily paper published an opinion specially formed through accurate knowledge. There is no need to go back to that strike for an illustration. Every week in the majority of daily papers may be found the crudest opinions upon railroads and transportation. Misstatements of facts and misjudgments upon railroad news are mixed with glittering generalities which have no meaning at all applicable to the case. And all this is gravely printed as editorial opinion. The question often occurs to us why our great journals do not employ specially qualified writers in dealing with such a complicated and yet immensely important industry as railroading, one which affects the interest of merchant and investor as does no other. "The decline of the editorial" may be traced to this ignorance of great subjects discussed. Writing for space will no longer answer.

One of the dispatches about Delagoa Bay says that the jaws of Portugal "guarantee the impairment of railroad capital." Probably the operator who wrote the dispatch was not a thorough master of the English language and meant just the opposite of what he said. We know of some laws which "guarantee the impairment of railroad capital"—those of Iowa and Minnesota, for instance—but we would not believe that an unprogressive country like Portugal is capable of making such wonderful laws as those of Iowa or Minnesota.

#### The Repair Work on the Pennsylvania Railroad.

A Pittsburgh paper gives interesting details of the work between Johnstown viaduct and Sang Hollow which it says was mostly done by officers and men summoned from the Pennsylvania lines west of Pittsburgh. General Manager McCrea and a score or more of his officers came to the aid of Superintendent Pitcairn and brought a force of 41 track foremen, 680 track laborers, 42 bridge foremen, 285 carpenters and 100 shop-carpenters, making, with the officers, nearly 1,200 men. A recapitulation of their work shows nearly 32,000 ft. of trestle work (48,000 ft. single) and about 38,000 ft. of track (29,000 ft. of main track and 9,000 ft. of sidings and switches), all constructed in 11 days. More than 200 car loads of cinders were put under the tracks, which were built to admit of a 30-mile-an-hour speed. There was an average of 25 cases of sickness and injury during the 11 days, but they were all well cared for by the company's physicians on the ground. Many of the men were unable to remove their clothing for fully two weeks. But the discomforts were borne without a murmur, and the road will, it is said, in addition to paying full wages while coming from and returning to their homes, pay every man double wages for every hour he worked and in addition give him a gratuity of \$5. This applies only to the wage earners and not to salaried officials.

Of the site of the Conemaugh shops and the condition of the locomotives a Johnstown correspondent of the Philadelphia Press says:

Where the round-house stood, at Conemaugh, there is not left a foundation stone. Of the 20 or 30 engines in the stalls when the flood came only 12 are in sight now. Out in the river-bed is one locomotive, of which only the top can be distinguished. A little nearer is another in the reversed position—the top is down and the wheels are up. Two others lie on their sides, one with the top up stream and the other with the top down stream. The force drove the pebbles and stones into the wheels and machinery wherever there was any space with such force that they can be dislodged only with a hammer. If an expert paver had gone about the work deliberately he could not have chinked up every hole



more thoroughly. The eight other engines stand or lie about in various positions. The 12 engines were 60-ton consolidations; the others were lighter and were carried down stream. Most of the tenders were carried down about three miles.

A pamphlet has been issued entitled "The Pennsylvania Railroad and the Great Flood," from which we make some extracts:

\* \* In this condition the officials of the Pennsylvania Railroad found the property over which they had control on the evening of Friday, May 31. The east was cut off from the north and west; there was a middle district, with Altoona as its centre, which was isolated from every other section, while the extreme west, with its local capital at Pittsburgh, was cut off from all assistance save that of the lines west of that point. In this extraordinary emergency each local official bestirred himself to repair as rapidly as possible the damage to his own division, so as to establish a connection with that beyond, knowing that his fellow-workers were moving in the same manner to reach him. Every one felt that the moment had arrived when not only his loyalty to the corporation but his capability would be put to the severest possible test. This spirit animated every employé, and it endowed them with new courage and abnormal energy for the accomplishment of the great purpose in view. A work was to be performed, which, considering the difficulties that surrounded it, seemed almost hopeless of execution, yet there was no time to think of failure, and every energy was bent to the one end of getting out of the trouble in the quickest possible time.

In the east the executive offices of the company were moved to Broad Street Station, Philadelphia, and from that point a general supervision of the situation were exercised by the general officers, although for the time being little else than securing and hastening forward supplies to all the available points could be done. All the skilled workmen and carpenters the eastern division were collected as rapidly as possible and from forwarded to Harrisburg to be distributed north and west as far west as the work on hand demanded. Bridge builders contracted with and their entire forces were sent out on the line. Reserve workmen from every quarter were called into requisition, and the superintendents of divisions that had escaped severe damage were directed to send all their available force and to secure all the help they could from other quarters. All the bridge lumber held in reserve at various points on the line was loaded on cars and forwarded or held subject to shipment to the points in need. In addition to this, the lumber dealers of Philadelphia, Wilmington, Baltimore and all accessible points were given *carte blanche* orders to load all the bridge lumber in their yards ready for movement at any moment. The same plan was pursued at every central point. That collected in the east was shipped to Harrisburg and thence north and west to the first breaks in the line, which were respectively at Montgomery Bridge, on the Philadelphia & Erie Railroad, 20 miles south of Williamsport, and Graubsville, on the Middle Division of the main line.

At Altoona a large reserve stock was always kept. That was forwarded eastward and westward for use at Manayunk and Mayes on the Middle and the Viaduct on the Pittsburgh Division. At Altoona, the surrounding territory from which to draw supplies was so limited by the washing out of the mills, and the failure of rail connection, that little aid could be obtained outside the reserve stock, yet the work of collecting it, wherever available, went on with such rapidity as the nature of the case admitted.

At Pittsburgh, when all the local resources had been exhausted, the western lines were called upon and they responded with men and material drawn from all points on the lines east of Cincinnati, Indianapolis and Chicago. An enormous amount of material and a large number of men were forwarded from the West to Johnstown, reaching that point before the flood had receded enough for the work of repair to begin.

The principal effort was directed to the reopening of communication with the West. To this end men and material were dispatched at once to Sunbury for the purpose of rebuilding the Montgomery Bridge over the Susquehanna, four spans of which had succumbed to the swift and swollen stream. They arrived at the scene of action without delay, but the condition of the river was such that the planting of trestles in the current was impossible. The flood subsided sufficiently by Tuesday, and within four days 400 men had bridged the river and re-established communication with the West, via the Philadelphia & Erie and the Allegheny Valley Railroads. This achievement is one of the marked features of the recovery of the road from this disaster, as it opened a route to the Pittsburgh Division, and enabled the force from the Philadelphia & Erie to reinforce the work on the Pittsburgh Division with both men and material.

In the meantime operations had been commenced in the Juniata Valley on the Middle Division. A force of 700 men was detailed to forward supplies from Harrisburg and mend the lesser breaks in the track, while 300 men were sent forward to rebuild the Granville bridge. This bridge, which was over 700 ft. long, was not only washed away, but all the piers save one had been wrecked. Work was commenced without delay and the site of the bridge was covered with a trestle 720 ft. long and 50 ft. high in six days. With this bridge completed and the track leading to it repaired, an advance was made two miles farther west to Mayes bridge, and there in four days a trestle 780 ft. long and 50 ft. high was erected. The track along this entire section suffered severely. The ties and rails were not only swept away, but the ballast and road-bed were carried with them. One section of some 1,500 ft. of track, near Mayes bridge, was lifted from its bed and deposited intact in the mud 100 ft. away, giving the appearance of a stout picket fence.

While the Granville and Mayes bridges were being constructed, the work was proceeding on the Manayunk bridge. Peculiar difficulties beset the progress of repair at this point. The locality was cut off from communication with any large centre of supplies, men were scarce, and the entire section having suffered great damage from the floods, it was not an easy matter to secure provisions for the workmen. Two hundred men were collected in the vicinity and the task of closing up the gap was pressed forward in the face of all obstacles. Bridge lumber was obtained at Huntington, Tyrone, and Altoona, and provisions for the workmen from the same quarter. Two or three miles of track had to be relaid on, and with the small force laboring day and night, the work was finished, and nine days after the flood the three large bridges and seven miles of double-track road had been rebuilt.

West of Altoona, between South Fork and Johnstown, a distance of 9 miles, the destruction was greater than on any other portion of the line, from the fact that to the force of the storm was added the violence of the flood from the broken reservoir.

A large body of men from Altoona began to work westward from the South Fork bridge, while a local force at Pittsburgh united with the large contingent from the lines west of that point; undertook the task of closing the gap between Johnstown bridge and Conemaugh bridge No. 6. The combined forces engaged in repairing this section of about 9 miles amounted to 3,900 men.

The force working west from South Fork had some very difficult work to perform. Beside the re-building of the

South Fork bridge, the replacing of the Conemaugh Viaduct fell to their lot. This trestle bridge is a magnificent example of extemporaneous engineering. It is 400 ft. long, 78 ft. high and is constructed on a curve.

The next important feature in the rebuilding of the road is the trestle bridge over the Conemaugh, known as No. 6. It is situated about half way between the Viaduct and Conemaugh Station. The river is wider at this point, and while the bridge and its trestle approaches is longer than the Viaduct, it is not so high by 30 ft. This bridge is also a fine specimen of rapid bridge building. It is constructed on quite a sharp curve, and the total length of the bridge and approaches is 600 ft.

A striking feat of engineering is seen at Conemaugh. Here about 1,500 ft. of the track was not only carried away, but the ground and stone on which it was laid shared the same fate. The current of the river was changed so as to run where the track once rested, and, in order to re-establish the line, trestling was put in for the entire distance and doubled so as to accommodate two tracks. From the eastern end of this trestle to the bridge at Johnstown the track with a trifling exception was built anew, a distance of three miles. The roadway along this section was exposed to the full force of the waters, and it was absolutely annihilated. Not only were the ties swept away and the rails bent and twisted into all manner of shapes, but the earth on which the road was built was carried off, and the track site so deeply covered in sand, gravel, and debris that the most experienced trackman could not with certainty locate the old bed. The entire work was finished and a solid line re-established in ten days.

The work was done in the face of the most serious obstacles. The lack of communication so as to concentrate material and laborers at desired points, the scarcity of material in certain quarters, and, above all, the inability to commence work on account of the continued high water and the incessant rain. There was not an entire fair day during the progress of the work of repairing, but on the contrary a careless downpour of rain fell in the western part of the State throughout the week succeeding the flood. The subsistence of the 5,000 men at work on the line was a question of great importance. The food had to be brought to them from distant points, and they had to be sheltered on the ground. Long trains of cars, arranged for sleeping purposes, were disposed at convenient places on side tracks, while at other points camps were pitched, where the men ate and slept. There was little sleep for them, and, in many instances, gangs of workmen labored without relief for twenty-four hours. Thus by ceaseless labor, marvelous energy, wonderful skill, an utter sacrifice of personal comfort on the part of engineers and workmen, the Pennsylvania Railroad recovered from a blow which would have paralyzed the energies of any other railroad of the world.

#### Australian Railroads.

Mr. Henry Grefrath, in his yearly communication to the *Journal* of the German Railroad Union on the Australian railroads, gives the following facts concerning those of New South Wales, the oldest of the colonies, having just completed its 101st year, on the eastern side of Australia, with an area of 308,800 square miles and, at the end of last June, 1,096,783 inhabitants. Its chief city, Sydney, has 125,000, and with its suburbs, 351,000 inhabitants, or about a third of the whole population of the colony, leaving the larger part of the interior very thinly peopled indeed.

At the end of 1887 the colony had 2,036 miles of railroad owned by the state and July 1, 1888, 66 miles more. There are besides two private railroads, one 45 miles long in a grazing district, and the other 36 miles, which was only opened last January, from the border of South Australia to some productive silver mines.

The 2,036 miles of state railroads completed at the close of 1887 had cost, on the average, \$63,420 per mile—not far from the average capital account of our railroads. The train service during the year 1887 was equivalent to a daily movement each way of 4.35 trains over the entire system. There were 14,451,303 passenger journeys, and 3,339,253 (long) tons of freight reported; but as there are specified 2,079,644 tons of coal, 1,936,663 head of cattle, 437,680 bales of wool, and 1,112,263 tons of "other freight," there must be some mistake here. The earnings were at the rate of \$5,553 per mile of road, and the working expenses \$3,665. The net earnings, \$1,888 per mile, were 2.96 per cent. on the capital invested, against 2.90 in 1886. In 1888 the gross earnings increased about 2 per cent. The net is not yet reported.

The equipment consists of 426 locomotives, 1,007 passenger cars and 8,798 freight cars. There is one railroad in the colony, the Darling Harbor line, in Sydney, which is but one mile long, and has cost no less than \$1,171,050. The next in cost, from Sydney south along the coast 58 miles, cost \$80,390 per mile; the cheapest, from June to Hay, 167 miles, \$27,375 per mile. The gauge of all the state roads, differing from that of the other Australian colonies, is the European and American standard of 4 ft. 8½ in.; the two private roads are of 5 ft. 3 in. and 3 ft. 6 in. gauge.

During 1888, 56 miles of state railroad were opened, and in 1887 the Parliament approved plans for the construction of 1,246 miles of new railroad, to cost about \$57,500,000; but the Legislative Council (an upper house) required more detailed information and submitted the plan to a committee, but the projects, perhaps modified, will be laid before the Parliament this year.

The government, moreover, owns 29¼ miles of tramways connecting Sydney with its suburbs, and the latter with each other. These carried more than 50,000,000 passengers in 1887, and earned \$1,042,075; but as the working expenses were more than 96 per cent. of the earnings, the net was but \$61,600, or 1¼ per cent. on their cost of \$170,333 per mile. It has been decided to light the cars hereafter by electricity.

South Australia is now a misnomer, as it extends from the south to the north coast, with Victoria, New South Wales and Queensland on the east, and West Australia on the west. It has the enormous area of 605,950 square miles, and only 312,100 inhabitants. It has been in financial difficulties, as might be guessed, from the fact that with this small population it has a public debt of more than \$100,000,000—\$323 per inhabitant; but it should be remembered

that the Australian colonies own the land, and get rental for it when used for grazing, and a pretty good price when bought for farming. There are also valuable mines in South Australia, for the profitable working of which railroads are necessary. July 1, 1888, the colony had 1,500 miles of railroad, and 80 miles more than the year before, and two lines, whose aggregate length will be 324 miles, were under construction. One of these extends from the recently entirely unsettled north coast, in the tropics (south latitude 12° 47') southeastward. Near the close of 1888, 124 miles of this line were opened.

The 1,500 miles open July 1, 1888, had cost on the average \$31,440 per mile. They earned during the previous year at the rate of \$2,667 per mile gross and \$1,462 net, which is at the rate of 4.66 per cent. on their cost. The efforts of the colony are now chiefly directed to the completion of a line entirely across the continent from the north to the south coast, of which parts have been completed, but 1,125 miles remain to be built.

This was the only Australian colony which had continued the use of three classes of passengers, and it abolished the third class July 1, 1888.

Queensland has been a colony only 30 years. Its area is 448,127 square miles and its population 366,940, of whom only 42 per cent. were females. It is the northeastern colony of Australia and largely in the tropics. Its debt is even higher than that of South Australia, being \$334 per inhabitant. Its first railroad was opened no longer ago than 1865. Its railroad progress may be shown summarily as follows:

Year...	1865.	1870.	1875.	1880.	1885.	1888.
Miles...	21	206	263	632	1,190	1,895

During 1887, 211 miles were opened, and in 1888, down to Nov. 15, 120 miles, at which date 365 miles were under construction, the contract for 38 miles was about to be let, and projects for 197 miles had been approved. All of the railroads are of 3½ ft. gauge, and all belong to the state. The system at the close of 1887 had cost \$31,215 per mile. They earned in that year \$2,283 per mile gross and \$738 net. The net was 2.13 per cent. on the capital invested, and the government had to provide for the interest from other sources the sum of \$1,368,892. The lines are mostly new, however, and the country is new, and unless the colony's growth shall be slower than has been expected, the railroads are likely to be a good investment.

The railroads of this colony, New South Wales, Victoria and South Australia are now connected by the completion of the Hawkesbury Bridge, to form a continuous line from Brisbane southward by Sidney to Melbourne, and thence to Adelaide, South Australia—1,812 miles.

Through round-trip tickets, good for three months, between Melbourne and Brisbane, are sold for £10 first-class and £6½ second class = \$48.66 and \$33.45, which are very low rates for a thinly-peopled country. The New York-Jacksonville rate of \$50 is for a much shorter distance. Queensland rates on agricultural products to Brisbane per ton (of 2,240 lbs.) per mile are: First 50 miles, 7 cents; following 50 miles, 2 cents; 100 to 200 miles, 1 cent; more than 200 miles, ½ cent. These rates from Kansas City or Omaha to Chicago would make the charge per 2,240 lbs. = 7 × 50 + 50 × 2 + 100 × 1 + 200 × ½ = \$6.95, or 31 cents per 100 lbs. It is not many years since the prevalent rate to Chicago was about equal to this, the country being very much more populous than Queensland is; but the railroads could not fall back on the government treasury to pay half the interest on their cost.

The colony of Victoria, which is on the southeast coast, has Melbourne for its capital, and, with an area of 87,850 square miles, has 1,060,000 inhabitants, had 2,017¼ miles of railroad in operation July 1, 1888, an increase of 137¼ miles within a year. In 1884 the government provided for the construction of 1,189 miles by a loan of £3,000,000, and of this 321 miles had been completed and 519 miles were under construction, while the remainder was to be given out to contractors during the current year.

The most notable fact in the working of the railroads during the year ending June 30, 1888, was the expenditure of £128,988 on account of the victims of the collision at Windsor, near Melbourne. Damages were paid to no less than 290 persons, in sums varying from £10 to £13,000 each. This was more than an eighth of the net earnings, which were thereby reduced slightly below the interest on the capital borrowed by the state to build the roads. But for that, the net earnings would have been 4.27 per cent. on the cost of the roads. The particular line on which the collision occurred is only 16½ miles long, and the damage account absorbed more than four-fifths of its net earnings, leaving the income on its capital cost only 1.33 per cent., against 7.37 the year before. The government, since the Windsor accident, has decided to make a slight increase in the passenger fares to serve specially as insurance against accidents. It has also decided to provide special storage at 170 stations (one to every 12½ miles) for such freight as milk, butter and cheese, and special trains to carry it directly to Melbourne, where cold storage is provided for it. At the close of 1888 the length of road in this colony had increased to 2,167 miles.

The fastest trains in Victoria are:			
	Distance.	Time.	Per hour.
	Miles.	H. M.	Miles.
Melbourne to Sandhurst.....	100	3 12	31.4
" " Ballarat.....	100	3 35	28
" " Adelaide.....	508	18 5	28
" " Sydney.....	576	19 11	30

The Railway Commissioners of the colony have decided to establish the "Victorian Railways General Library," which is to include all publications relating to railroads. At the close of 1888 it contained 3,115 volumes.

West Australia has a larger territory than any of the other Australian colonies—nearly a million square miles—but its



population was only 42,043 at the end of September, 1888. It has six state railroads in operation, whose aggregate length is 199 miles, the longest being 110 miles long, and 53 miles of private railroads, built to carry timber from forests to the sea coast.

A line 245 miles has been opened this year which was built by a company which received a land grant of 12,000 acres per mile. Another line 260 miles long similarly subsidized is being constructed and probably will be completed by the end of next year. Negotiations are in progress for another line, 750 miles, to be begun within two years and finished within seven, for a grant of 25,000 acres per mile.

Tasmania, the island formerly known as Van Diemen's Land, has 142,478 inhabitants. At the end of 1887 it had 318 miles of railroad in operation and 123 under construction. The lines in operation barely earn their working expenses, and the government pays the interest on their cost. In 1888 6½ miles more were opened and 49 miles were put under contract.

New Zealand, which is generally regarded as on the average more fertile than Australia itself, but has not been settled long, has been too ambitious, and is now suffering from a reaction. With an area of 103,800 square miles, it had 603,361 inhabitants at the end of 1887, and in the first ten months of 1888 the emigration exceeded the immigration by 9,340, so that the population for the time is decreasing, the result of hard times. At the end of March, 1888, the colony owned 1,751 miles of narrow gauge railroad in operation, and there were besides 92 miles owned by companies. In the following six months the net earnings of the state system were equal to 2.3 per cent. of its cost. The traffic is very thin, the average train movement being equivalent to 2.3 trains each way daily over the entire system.

The seven Australian colonies together at the close of 1888 had 10,081 miles of railroad in operation, being an increase of 456 miles during the year, which is not inconsiderable for a population of 3,552,000 people, though it is scattered over a surface of more than 3,000,000 square miles. The colonial debts amount to nearly \$800,000,000, which is as heavy in proportion to population as a debt of \$14,000,000,000 for the United States, including state as well as national debts. It is very important to bear in mind, however, that the Australian colonies have something to show for their debt; they own nearly all their railroads, and they own most of the unoccupied lands, which are usually not given away, but sold to settlers, at prices as high as a pound per acre. The borrowing of money to build railroads which will make this vast landed estate marketable, even though the lines should not for years earn interest on their cost, might be good policy for an individual land-owner; but in land operations it is very easy to miscalculate the amount that will be taken in a given time, especially when competing owners make improvements to attract buyers or tenants; and the different Australian colonies with respect to each other are somewhat like different land owners in a new city or country. In the aggregate they may provide more houses, and streets and farms than they can get occupants for.

#### RAILROAD LAW—NOTES OF DECISIONS.

##### Powers, Liabilities and Regulation of Railroads.

In Missouri, the property of the defendant railroad company, which was insolvent, was made up of the consolidation of a number of lines, some of which were taken by lease. Receivers were appointed to manage the entire system, and it was provided that any lessor might at any time assert his right to possession of lines leased by him for unpaid rent. On the petition of the receivers, showing that one branch of the system, leased to the defendants by the intervenor, was earning more than operating expenses, an order was made directing that after meeting obligations which had been directed to be discharged by former orders, the rental on such branch should be paid to the intervenor, until otherwise directed, out of the rents and profits. The Federal Court holds that, as the obligations directed to be paid by former orders amounted to a large sum, and were never paid, the intervenor had no right to rely upon said order, and was not entitled to rent under it.<sup>1</sup>

In Missouri an ordinance of the city of St. Joseph gave the St. J. & C. B. R. Co. the right of way over certain streets to George alley, provided that its road within the city limits should be open to all other railroad companies that should have obtained permission of the city. Thereafter the St. J. & C. B. R. Co. consolidated with the M. V. R. Co., forming a new company, the defendant, which built its road from the terminus at George alley, and connected with the M. V. tracks, making a continuous road through the city. The Federal Court rules that the new company is not entitled to the rights of the old one.<sup>2</sup>

The Supreme Court of Wisconsin holds that the legislature has the power to enact laws for the enforcement of liens for labor upon bridges and other structures of a railroad company, though part and parcel of its road, and essential to the complete operation thereof.<sup>3</sup>

The Supreme Court of Indiana rules that where a contractor engages to construct its road for a railroad company, stipulating that he shall not be required to commence work until after the company has become possessed of means to pay him, and on account of a deficiency of funds the contractor refuses to proceed with the work, a contract entered into by third parties, by which they agree that, if the contractor will go on with the work, they will make up such deficiency, is founded upon a consideration, and is valid.<sup>4</sup>

In New York the Supreme Court decides that under the Rapid Transit Act giving to companies formed thereunder the right to acquire the real estate necessary to enable them to operate their railroads, such a company, which has two routes, crossing each other at right angles, whereby the danger from collision is great, may acquire the corner property at such crossing for the purpose of providing the curve necessary to allow the trains on one route to turn into the street occupied by the other, and thereby to avoid such danger.<sup>5</sup>

##### Carriage of Goods and Injuries to Property.

In Georgia the Supreme Court rules that a railroad whose line extends from Atlanta to West Point, Ga., having received at Atlanta goods for shipment, consigned to Dallas, Tex., and having fixed by contract with the consignor the rate of freight for the whole distance, apportioning a part of the same among these carriers, itself included, to New Orleans,

and assessing the balance for the transportation beyond New Orleans, the contract was, *prima facie*, a through contract, and bound the initial company for performance to Dallas, the point of destination. This was so, notwithstanding the named rate was subject to change without notice.<sup>6</sup>

In Missouri it is held by the Supreme Court that where an agent to whom goods are consigned by his principal, and who has no pecuniary interest in them beyond his lien for commissions, contracts with a common carrier for their delivery, he may sue the carrier in his own name for their wrongful delivery.<sup>7</sup>

The Supreme Court of Texas holds that an express warranty in a policy of insurance that "this insurance shall not inure to the benefit of any carrier" is valid, and all rights under the policy are forfeited upon the execution of a contract by the insured to give the carrier the benefit of such insurance. The fact that the contract of insurance was issued without the knowledge or privity of the carrier is immaterial.<sup>8</sup>

In Tennessee the Supreme Court rules that where goods are delivered to a railroad for shipment under a bill of lading stipulating that in case of loss the measure of damages should be the value of the goods at the place of shipment, but the carrier was guilty of a conversion of the goods, such stipulation in the bill of lading is properly ignored, and the value of the goods at the place of destination is the measure of recovery.<sup>9</sup>

In Kentucky it is laid down by the Court of Appeals that to entitle an abutting owner to enjoin the operation of a railroad in a street, which has been constructed by legislative sanction and with the consent of the city, it must clearly appear that he has been deprived of his right to the reasonable use of the street, and not merely that he has suffered an annoyance or inconvenience, though such as to entitle him to legal redress.<sup>10</sup>

In Missouri the defendant constructed its railroad upon a public street for which no grade had been established, but which would evidently require grading in the near future. The track was laid two or three feet above the natural level of the street, practically cutting off access from the street to plaintiff's abutting lots. The Supreme Court holds that plaintiff was entitled at least to nominal damages, and to such actual damages as he may suffer by the diminution of rental value, but could not recover for a depreciation in the total value of the inheritance, as it cannot be presumed, in view of the condition of the street, that a permanent nuisance was intended.<sup>11</sup>

The Supreme Court of Arkansas holds that in a proceeding by a railroad company to condemn land for a right of way, the assessment of damages is not necessarily restricted to the injury done to the particular tract described in the petition. If the tract described is part of a larger connected body of land, the owner may recover for injury to the tract as a whole. If the tract traversed by the road is part of a farm, its use as such is notice to the company that an injury to a part impairs the value of the whole farm as a unit.<sup>12</sup>

In the same state it is held by the Supreme Court that in ascertaining the amount of damages to be awarded to the owner of a farm part of which is taken for a railroad, the tendency to frighten teams employed on the farm, by the running of trains, etc., is not too remote to be taken into consideration.<sup>13</sup>

##### Injuries to Passengers, Employees and Strangers.

In Massachusetts the Supreme Judicial Court rules that children of such age that they are carried free if accompanied by adults are passengers for whose safe carriage the railroad is responsible, even though those in charge of them are riding on free passes.<sup>14</sup>

In New York a passenger took a train on an elevated railroad about 5.30 a. m. The morning was cold, and during the night it had been sleeting, making it dangerous to walk on the sidewalks. On going down the stairway leading from the station to the street, he fell and fractured his leg. He was taken to the hospital, where he died a few days after, there being evidence that he had been drinking freely before the accident, and that the delirium from which he died was delirium tremens. The stairway was inclosed the height of a hand-rail, and was covered by a roof projecting about a foot on each side. The steps were very slippery at the time of the accident, and there was no evidence that any ashes or sawdust, or anything of that nature, had been spread on them, or that any attempt had been made to remove the snow and sleet. The Court of Appeals holds that the railroad is not responsible.<sup>15</sup>

In Indiana, in an action for damages for injuries to a passenger on defendant's train through a collision at a crossing, it appeared that a watchman was stationed at the crossing with signals to regulate the passage of trains; that the engineer of defendant's train brought his train to a stop 700 ft. south of the crossing, rang the bell and sounded the whistle, and obtained the signal for his train to pass over the crossing. The Supreme Court rules that the failure of the engineer to stop his train near the crossing and inform himself whether or not there was an approaching train on the other railroad, and in the vicinity of the crossing, was gross negligence, for which defendant was liable.<sup>16</sup>

The Supreme Court of Pennsylvania decides that a rule, made by a railroad company, to sell tickets and deliver baggage at only one of its five stations in a city, which is less convenient for such passengers as desire to transfer baggage to another road, and to carry all baggage on to the main station, though the trains regularly stop at the other stations to allow passengers to alight from or get on them, is unreasonable and void.<sup>17</sup>

The Supreme Court of Illinois rules that where one purchases a ticket, which the conductor acting under instructions, but without legal right, refuses to accept, and the passenger, refusing either to pay or leave the train, is expelled, the latter may recover the cost of a ticket from the point where he was expelled to his destination, and such damages as he sustained on account of the delay in being required to leave the train. The passenger may also recover for the indignity in being compelled to leave the train; and, if more force was used than was necessary in ejecting him, he may recover for the personal injuries resulting directly from such excessive force.<sup>18</sup>

In Mississippi the Supreme Court holds that where a passenger on a train is abused and insulted by the conductor, who has been informed that he has sold his ticket, which was not transferable, and, without being given reasonable time to produce his ticket, is required to leave the train, he may recover exemplary damages.<sup>19</sup>

A statute of Massachusetts provides that if by reason of the negligence of a railroad company the life of a passenger, or of a person being in the exercise of due diligence and not a passenger, is lost, the company shall be liable in damages assessed with reference to the degree of culpability of the company or of its servants or agents. Defendant was operating a road leased from the state. An accident was caused by water working away the embankment under the track, the ditches having been filled for two months, and persons riding on the train were killed. The Supreme Judicial Court holds that the defendant was not responsible for the defective condition of the road unless it had notice of the same, or might have had notice by exercise of due care. But it is liable if the danger might have been discovered by due care,

even though the defect was in the original construction of the leased road, or was due to failure of the commonwealth to make repairs which it was under contract to make.<sup>20</sup>

In Pennsylvania the conductor of a train announced that the next stop would be at J. At the next stop some one called out the name of the station J. In fact the train had been signaled, and had stopped before reaching the station. Plaintiff, a passenger, got off hurriedly, thinking he had reached the station, and, it being a dark, rainy and freezing night, when he stepped from the train he fell into a creek and was injured. The Supreme Court holds the railroad liable.<sup>21</sup>

The Supreme Court of Georgia rules that if an employé is killed while in disobedience of a rule of the company or an order of the conductor, given him while he is under the command of the conductor, his widow cannot recover unless the disobedience did not directly or indirectly contribute to the injury, and that the burden is on plaintiff to show that it did not thus contribute. But if the employé were in the habit of disobeying him, with his knowledge, in the way that deceased was doing, it would not bar recovery.<sup>22</sup>

A Kentucky statute provides that, if the life of any person is lost by the willful neglect of any other person or corporation, or of their agents or servants, punitive damages may be recovered therefor. The Court of Appeals decides that where a servant is killed in working on dangerous premises, furnished by the master, and he knew the condition of the premises, and continued to use them without objection, the master is not liable, as he is not guilty of willful neglect.<sup>23</sup>

In Missouri an engineer pulled his train in on a side track to clear the main track for a passenger train then due. He could not see to the rear of his train from either side of the cab, on account of obstructions, and at a call from the rear brakeman stepped on the main track, and directed the fireman to move the train forward. While standing on the track, and looking to the rear of his train, a hand-car with sectionmen on it ran over him. The car was run at a very rapid rate of speed. When at the depot, the sectionmen could see to and beyond the place where deceased was standing. The Supreme Court holds the railroad liable and that the engineer's action is not defeated by the fact that at the time of the accident he was violating a rule forbidding engineers to permit firemen to operate the engine, except when they are themselves present upon it, there being evidence to the effect that at the time of the accident, and for years before, there was an established usage on the part of defendant's engineers, known and acquiesced in by the superior officers, to allow firemen to make short moves, the engineer not being at the time on the engine, but near enough to give directions.<sup>24</sup>

In Georgia the Supreme Court rules that the diligence and care in sounding whistle or bell and checking speed of trains at crossings is generally for the benefit of those crossing the track and not those walking along it. Ordinary care by one crossing a railroad upon a public crossing is not the measure of ordinary care for one using the track to walk upon, although at the moment he may be at or on such a crossing. One who undertakes to make a pass-way of a railroad must use that degree of diligence which every prudent person uses who puts himself unnecessarily in a perilous situation.<sup>25</sup>

The Court of Appeals of Kentucky holds that the fact that a railroad crosses a highway on a trestle does not exempt it from the duty of giving warning of the approach of its trains to such crossing.<sup>26</sup>

In Texas a boy, nine years old, was last seen by his father walking between the rails in the direction of his home, which was ¼ mile distant: about an hour and a half after a heavily-loaded freight train passed, carrying a bright head-light, and making a noise that could be heard for a mile; next morning the mangled remains of the boy were found on the track, 150 or 200 yards north of a crossing, blood having been found on the track some distance from the crossing; contrary to the usual custom, no bell was rung or whistle blown at the crossing on this occasion. The engineer testified that he kept a careful lookout and ran over no one. There was no witness to the accident, and nothing to show that the boy, who had been reared in the vicinity, and was bright and well-acquainted with the danger from the railroad trains, had exercised due care. The Supreme Court reverses a judgment against the railroad.<sup>27</sup>

<sup>1</sup> Central Trust Co. v. W., St. L. & P. R. Co., 38 Fed. Rep., 63.

<sup>2</sup> Chicago, St. P. & K. C. R. Co. v. K. C. St. J. & C. B. R. Co., 38 Fed. Rep., 58.

<sup>3</sup> Purcell v. Chicago Forge & Bolt Co., 42 N. W. Rep., 265.

<sup>4</sup> Brownlee v. Lowe, 20 N. E. Rep., 301.

<sup>5</sup> Re Union El. R. Co., 4 N. Y. (Supp.) 85.

<sup>6</sup> Atlanta & W. P. R. Co. v. Texas Grate Co., 9 S. E. Rep., 600.

<sup>7</sup> Wolfe v. Mo. Pac. R. Co., 11 S. W. Rep., 49.

<sup>8</sup> Ins. Co. of North America v. Easton, 11 S. W. Rep., 181.

<sup>9</sup> Erie Dispatch Co. v. Johnson, 11 S. W. Rep., 441.

<sup>10</sup> Hyland v. S. R. Trans. Co., 11 S. W. Rep., 79.

<sup>11</sup> Smith v. K. C. St. J. & C. B. R. Co., 11 S. W. Rep., 250.

<sup>12</sup> F. & L. R. Co. v. Hunt, 11 S. W. Rep., 418.

<sup>13</sup> F. & L. R. Co. v. Courts, 11 S. W. Rep., 419.

<sup>14</sup> Littlejohn v. Fitchburg R. Co., 20 N. E. Rep., 103.

<sup>15</sup> Kelly v. Manhattan R. Co., 20 N. E. Rep., 385.

<sup>16</sup> G. R. & I. R. Co. v. Ellison, 20 N. E. Rep., 135.

<sup>17</sup> P. C. & St. L. R. Co. v. Lyon, 16 Atl. Rep., 607.

<sup>18</sup> Penn. Co. v. Cornell, 20 N. E. Rep., 89.

<sup>19</sup> L. & N. R. Co. v. Mayben, 5 South. Rep., 401.

<sup>20</sup> Littlejohn v. Fitchburg R. Co., 20 N. E. Rep., 103.

<sup>21</sup> Phila. & R. R. Co. v. Eadelstein, 16 Atl. Rep., 847.

<sup>22</sup> Parker v. Richmond & D. Co., 9 S. E. Rep., 530.

<sup>23</sup> Needham v. L. & N. R. Co., 11 S. W. Rep., 306.

<sup>24</sup> Barry v. H. & St. Joe R. Co., 11 S. W. Rep., 308.

<sup>25</sup> Cent. R. Co. v. Rawford, 9 S. E. Rep., 168.

<sup>26</sup> Rupard v. Ches. & Ohio R. Co., 11 S. W. Rep., 70.

<sup>27</sup> Mo. Pac. R. Co. v. Porter, 11 S. W. Rep., 324.

#### TECHNICAL.

##### Car Notes.

The Missouri, Kansas & Texas has ordered 500 new coal cars.

The Ellis Car Co., of Amesbury, Mass., last week shipped two open and one closed car to Toledo, O.

The Newburyport Car Co. shipped to Boston last week two open cars, constructed with iron posts and frames, made of wrought and malleable iron, which were designed by the Superintendent. The roofs are also of a new design, and are especially adapted to the use of electric motor cars. The company has 12 of these cars nearly completed for the East Boston & Revere Beach Road.

##### Bridge Notes.

The commissioners of Washington County, Tex., will receive bids for building two bridges until Aug. 12, bidders to furnish plans and specifications.

The county commissioners will build a bridge across the Smith River at Leaksville, N. C., and will award the contract about July 15.

Proposals are wanted until July 6 for the erection of an iron superstructure over the Tuscarawas River, at Clinton, Ohio.

The Youngstown Bridge Co., of Youngstown, O., is making rapid progress in the erection of its plant near Youngstown. The capital stock is \$100,000, paid up. The main building will be 75x300 ft., with a wing 60x105 ft., and the other buildings will cover a large space. The company is now ready



to make contracts and the works will be in full operation within 60 days. J. W. McDonald, late superintendent of the Mt. Vernon Bridge Works, is Manager, and W. L. Cowles, late engineer of the King Bridge Co., Cleveland, is Chief Engineer.

The contract was let last week at Beardstown, Ill., for a highway bridge consisting of seven spans of 107 ft. each, with a draw of over 300 ft., the entire structure to be 1,060 ft. in length. There were eight bidders for the work. The contract was awarded to the Milwaukee Bridge & Iron Works.

The contract was let this week for the construction of a wrought-iron highway bridge over the Passaic River, at Rutherford, N. J.

The Atlanta Bridge & Axle Co. has commenced building an iron bridge over the Chattahoochee River at Euftaula, Ala., for the Central of Georgia.

The Pittsburgh Bridge Co. has been awarded contracts for new bridges at New Florence, Nineveh, Blairsville and Livermore, in Pennsylvania.

The Canton (O.) Iron Works have been awarded the contract to build a bridge at Rockville, Ind., across the Big Raccoon at \$4,900. There were 15 bidders.

Proposals are invited by the United States Government for the construction of an iron or steel bridge across the Kansas river at Fort Riley, Kan. The bridge will consist of a main span of 250 ft., resting on iron tubular piers, and an approach span of 80 ft. The main span will be a pin-connected truss, and the approach span may be either pin-connected, or built as a plate or lattice girder. This span will be located over the tracks of the Union Pacific.

The Berlin Iron Bridge Co., of East Berlin, Conn., has received the contract for a new foundry building for the Wilcox Crittenden Co., of Middletown, Conn., to be made entirely of iron. The company is also building a new iron building for the Holmes, Booth & Hayden Co., of Waterbury, Conn., and a new iron casting-house for the Shelby Iron Works at Shelby, Ala.

#### Manufacturing and Business.

Sales of the Dunham storm-proof freight car door have recently been made to the following roads: Richmond & Danville; New Brunswick; Fitchburg; Cleveland & Canton; Seaboard & Roanoke; Kansas City, Fort Scott & Gulf; St. Louis, Arkansas & Texas; Kansas City, Wyandotte & Northwestern; Lake Erie & Western; Chicago, Burlington & Quincy and the American Live Stock & Transit Co.

The Boston & Albany will light its new depot at Springfield, Mass., with the Edison system, driven by two 65 h. p. Westinghouse compound engines, coupled directly to the shafting.

The Brown & Sharpe Manufacturing Co., of Providence, R. I., has recently brought out an improved set of steel reference discs, 45 in. in the set, hardened and ground for use in connection with ordinary machine shop manipulations such as testing sizes, setting calipers and making standard gauges.

The Billings & Spencer Co., of Hartford, Conn., has built an addition of 40 x 90 ft. to the rear of its forge shop. This new building is of brick, with 16-in. walls, and is soon to be extended to the street in front. The new die fire-proof building is 40 x 66 ft., and contains more than 100 tons of dies, which are numbered and classified in such a way that a moment's inspection of the catalogue locates any desired pattern. This firm now makes solid crescent drop-forged steel gauges in the rough, in sizes from  $\frac{1}{4}$  in. up to  $2\frac{1}{2}$  in., advancing by eighths, so that by grinding out  $\frac{1}{16}$  in., double this number of sizes can be obtained. This firm is also making full sets of special drop-forged steel wrenches for locomotives.

The American Steam Gauge Co., of Boston, Mass., is adding some of the most improved tools and machines to its works, with a view of increasing and reducing the cost of production as well as improving the quality.

The orders for May of the Westinghouse Machine Co. aggregate 82 engines footing up to over 4,500 h. p., of which 2,200 h. p. was for compound engines. The demand for the compound engine is steadily on the increase. In the first six days of June their orders had already amounted to 1,000 h. p.

The American Tool Works, of Cleveland, O., intend to enlarge its plant, and will probably put in a compound condensing engine of 150 to 200 h. p. Part of this power will probably be distributed to others by electricity.

The Robert W. Hunt Co., Bureau of Inspection and Tests, at Chicago, is at present engaged on deliveries of rails to the Pennsylvania Company; Baltimore & Ohio; Georgia; New York Central & Hudson River; New York, Lake Erie & Western; Central of New Jersey; Fitchburg; Chicago, Rock Island & Pacific; Alabama Terminal & Improvement Co.; Chicago & Eastern Illinois, etc.

The Newton Machine Tool Works, of Philadelphia, have been awarded the contract for building the cylinder boring machines for the Westinghouse Air Brake Co.'s new works near Pittsburgh.

Work has begun on the foundation of the Fitchburg wood-working machine shop at East Fitchburg, Mass. The new structure will be 30 x 60 ft. and two stories high. The lower story is to be filled with wood-working machinery. Upholstery and cabinet work will be done on the second floor. The erection of the two remaining shops will probably be postponed till next year.

The American Brake Co. is crowded with orders for engine brakes, and is compelled to make enlargements of its plant in order to meet the increasing demands. Only a few months ago the company expended some \$20,000 or \$25,000 in extensions and additions to equipment, but further enlargements and improvements have been since ordered. The blacksmith shop is being extended into another large room, in order to give more space for the working of the steam hammers, and in an outlying building a large jannpanning oven is in course of construction. The company's steam plant consists of the Babcock & Wilcox boilers, the Roney mechanical stoker and the Westinghouse compound engines. All the steam pipes are covered with the Magnesia sectional covering.

The Omaha & Council Bluffs Railroad & Bridge Co. has placed orders for three more Westinghouse compound engines of 200 h. p. each, making five in use in this plant.

The Dunham Manufacturing Co. report recent sales of the globe ventilator to the West Shore, Boston & Maine, Central of New Jersey, Michigan Central, Missouri Pacific and the New Brunswick Railroads.

The Central steel brake beam, for which Thos. B. Inness & Co., 115 Broadway, New York, are agents, was shown at Saratoga, applied to the Wagner car, which was equipped with the Pintsch light.

The recently circulated report that by reason of his late illness Mr. Charles P. Deane, of the Deane Steam Pump Co., of Holyoke, Mass., has been permanently injured is wholly without foundation. We have his own words for it that he never felt better in his life. Although he was at one time given up by his physicians, he is now full of business engage-

ments. The works are running 24 hours, and are working on several water stations for railroads.

#### Iron and Steel.

The immense plant of the Reading Iron Works, which failed four months ago for over \$1,000,000, was put up for sale at Reading, Pa., July 1. The bidding began on the property in its entirety, and was sold to William P. Bard, of Reading, for \$150,000, subject to a mortgage of \$600,000. Mr. Bard purchased it for the Philadelphia & Reading Railroad.

The Sterling Steel Works, of Demmler, Pa., are about to be increased in size. The company has been reorganized and the capital stock increased \$150,000.

The Carbon Iron Co. has, within the last two weeks, completed two new heating furnaces, with 28 ft. beds, almost doubling its output. The company is very busy on a large order for iron to be used in the new Merchants' Bridge at St. Louis, and is also turning out some heavy universal plates made entirely from open-hearth steel for the Watervelt Arsenal, at West Troy, New York.

The Paige Tube Co. has been organized at Warren, O., to succeed the Warren Tube Co., of that place. Arrangements are being made to put the works in operation. T. S. Bray, formerly Manager of the tube department of the Riverside Iron Works, at Wheeling, W. Va., will be Superintendent.

The Birmingham Rolling Mill Co. of Birmingham, Ala., held its annual meeting recently, electing the following officers: G. W. Norton, President; W. B. Caldwell, Vice-President; B. du Pont, Treasurer. Thomas Ward is General Manager of the mill, and John D. Dwyer is Superintendent in charge of the mill departments.

The Louisville & Nashville has placed orders for the season for spikes with the Tredegar Iron Works, for splicers with the Springfield Iron Works, and for bolts with the Upton Nut Co.

The annual meeting of the Bethlehem Iron Co. was held at Bethlehem, Pa., last week, the company electing the following officers: President, W. W. Thurston; Vice-President, R. P. Linderman; Treasurer, C. O. Brunner; Secretary, Abraham S. Schropp. There has been no change in the management of the works.

The rolling mill of the Wheatland Iron Co., at Wheatland, Pa., which has been idle for some years, has been put in operation under the management of Henry Friend, of Pittsburgh.

The Pennsylvania Construction Co., of Pittsburgh, has been given the contract for the iron roof for the post-office building, now in course of erection in that city. The contract price for the work is \$50,740.

The Columbus Machine Co., of Columbus, O., is building three blowing-engines for James Leffel & Co., Springfield, O., for the use of the Bookwalter Iron & Steel Co. in the new Bookwalter process of steel-making. The engines are of 40-in. diameter and 2 ft. stroke.

McClure & Schuler, of Pittsburgh, have contracted with the Riverside Iron Works, of Wheeling, W. Va., for the erection of a new blast furnace in place of the present one at that place. It will be fitted with three Massick & Crooke's hot blast fire-brick stoves. In October last there were but three of these stoves in operation in this country. Since that time 72 stoves have been put in operation, including the following list: Three for the Williamson Iron Co., at Birmingham, Ala.; three for the North Chicago Rolling Mill Co., at Bay View, Wis.; three for the Thomas Iron Co., at Niles, Ohio. There are now 16 stoves in course of erection. This includes the following orders: Three for Schoenberger, Speer & Co., at Pittsburgh; two for the Paducah Iron Co., at Paducah, Ky.; one for the Chicago Furnace Co., at Chicago, to supplement the present fire-brick stoves, and four for the Carrie Furnace Co., of Pittsburgh.

#### The American Solid Steel Wheel.

There was shown at the Car-Builders' Convention at Saratoga last week a solid steel wheel made by the American Car Wheel Co., of Boston. The fragments of a broken wheel exhibited showed a fracture of fine and homogeneous structure. The wheel before being put in service is turned true and mated. The same metal of which these wheels are made has been in use for some time for tires on some of the New England roads, and has given a mileage of 250,000 miles in two years. Several wheels have made over 172,000 miles without turning. The company will guarantee a mileage of 50,000 miles for the solid wheel. The wheel which was exhibited weighed 650 lbs., and it was stated that it would be sold at \$22.50, and orders will be taken now for wheels for any sort of equipment in size of from 28 to 42 in. The agency for the sale of this wheel has been taken by Fred. A. Houdlette & Co., 272 Franklin street, Boston, Mass.

#### The New Locomotive Shops at Horwich, England.

One of the most interesting places which the American Engineers have visited in England is the new locomotive shops of the Lancashire & Yorkshire, at Horwich, a few miles from Manchester. These shops are of particular interest because they were designed from the past experience of two well-known railroad men, Mr. Ramsbottom and Mr. Aspinwall, who has charge of the shops and is the Locomotive Superintendent of the Lancashire & Yorkshire Railroad. These shops cover 13 $\frac{1}{2}$  acres, and are fitted in the most complete manner with modern tools of all descriptions.

They have been erected for the purpose of repairing and renewing the whole of the locomotive stock and carrying out the mechanical engineering work of the road. The carriage of materials from stores and work to their several shops is done by means of tramways, 18-in. gauge, of which there is five miles, the heavy work being drawn by small locomotive engines specially built for the purpose. The whole of the furnaces in the steel foundry and forge are heated by gas made from a series of Wilson's gas producers. The iron foundry is 212 ft. long by 111 ft. wide, fitted with two cupolas, supplied with blasts from a Root's blower. Hydraulic power is used for working the cranes, in addition to which there are two overhead rope-power traveling cranes. The natural formation of land which necessitates the rail level at rear of foundries being considerably higher than the floors of foundries, permits of coke and iron being unladen and wheeled direct to the charge holes of the cupolas.

The erecting shop, 1,520 ft. long by 118 ft. wide, has been arranged for the repairs of existing and the building of new engines and tenders, and is supplied with twenty 30-ton overhead power cranes, driven by wall engines. Access for engines to the centre portions of this long shop is obtained by two transfer tables driven by chains.

As a whole this shop is one of the most modern in the world. Without a visit to the works in actual operation a full comprehension of the vastness and completeness of detail cannot be had; and one must see the special machinery at work upon the various details of construction in order to obtain a realization of the value of special machinery for this class of work. Among the many interesting features of the shops may be mentioned planers with special beds to receive special work, large milling machines for

the bodies and stub ends of connecting and parallel rods, long lathe beds, 75 ft., with several head and tail stocks at any desired distance apart, with shifting countershaft on long, cast iron brackets to allow the head stock to be moved at will; special grinding machines for bushings and holes in valve gear connections; special cylinder benders, drills and port milling machine; a new design of combined boiler sheet edge planer and boring mill for facing curved sheets after flanging; hydraulic press for shaping steel plate; metal saws, both cold and hot, at high speed, and cold with sharp teeth to cut steel and iron as with a milling cutter; special boiler sheet drills, and, not the least important, a most ingenious device for drilling and tapping stay bolt holes and screwing in the bolts.

#### Indian Railroads.

In a communication from the India Office to the Manchester Chamber of Commerce, which had urged on Viscount Cross the importance of a more rapid development of the Indian railroad mileage, it was stated that the total mileage completed on the 31st of March, 1889, was 15,243 $\frac{1}{2}$  miles, of which 880 $\frac{1}{2}$  miles had been opened during the past twelve months. In addition to this, there were then 341 miles under construction.

#### The Siberian Railroad.

The Special Commission sitting at St. Petersburg, and dealing with the question of the Siberian Railroad, has just concluded its labors. It has adopted, in its entirety, the project elaborated for this purpose by the late General Fankler. According to this scheme, the railroad will pass by Omsk, Tomsk, Irkutsk, Tchita and Stretensk, and will end at Vladivostok. The whole line will be constructed in five or six years. The cost of construction is estimated at 25,000 roubles per verst, or about 80,000 francs per kilometre.—*Herapath's*.

#### Burnt Clay Ballast.

The Iowa Clay Ballast Co., of Kansas City, has been given large contract for supplying the burnt clay ballast to the Chicago, Burlington & Quincy, which has had a considerable length of line in Iowa ballasted with it for some time. The ballast is also used by the Chicago, Rock Island & Pacific. The Chicago, Burlington & Quincy furnishes the coal for burning the clay and transports it, it being burnt and loaded by the Iowa Clay Ballast Co. at 50 cents a yard. It is estimated that the total cost of placing it under the track will be 94 $\frac{1}{2}$  cents per yard against \$1.25 for stone ballast. The cost to the Chicago, Rock Island & Pacific, burnt and loaded, is about 63 cents per yard.

#### Approximate Formulas for the Ellipse and Ellipsoid.

Mr. Bousinesq has recently presented to the French Academy of Sciences two simple formulas which give the circumference of an ellipse and the surface of an ellipsoid, with sufficient accuracy for practical purposes.

1. *Except in the case of an eccentricity closely approaching unity, the total length of the ellipse is sensibly equal to the circumference of a circle, whose diameter is the excess of three times the arithmetical mean of the semi-axes over their geometrical mean.* Calling  $a$  and  $b$  the semi-axes, and  $R$  the radius of the circle whose circumference equals the length of the ellipse,

$$2R = 3 \times \frac{a+b}{2} - \sqrt{a \times b}$$

For an eccentricity,  $e = 0.9659$ , the error is less than  $\frac{1}{10}$  of the result; for  $e = 0.9848$ , it is about  $\frac{1}{50}$ , and is sensible in ordinary operations.

2. *When the greatest eccentricity is sufficiently less than unity the area of an ellipsoid is nearly equal to the surface of a sphere whose radius is four-fifths of the arithmetical mean of the semi-axes plus one-fifth of their geometrical mean.* If  $a$ ,  $b$  and  $c$  are the semi-axes, and  $R$  the radius of the sphere of equal surface,

$$R = \frac{4}{5} \times \frac{a+b+c}{3} + \frac{1}{5} \times \sqrt{a \times b \times c}$$

This formula is not quite as accurate as the preceding, but it will not give an error greater than 0.002 of the result, when the ratio of the shortest axis to the longest exceeds about seven-tenths.

#### The Contracting Chill.

The specifications of the Union Pacific for new car wheels call for the use of Farr's contracting chill in casting them.

#### A Few M. C. B. Exhibits of Especial Interest.

Among the exhibits at the Saratoga Convention which we have not mentioned before was a Wagner car equipped with the latest Pintsch lamps and other apparatus for compressed gas lighting. This car was lighted every evening at the station, and was visited by many of the delegates.

The Van Dorston coupler was shown, also the Standard and the Gould, applied to cars. Exhibition tests of the Van Dorston and the Standard were made Thursday afternoon.

A Philadelphia & Reading car with Meneely roller bearings which had run 11 months was shown also.

#### Electric Light for China.

The *Iron and Steel Trades Journal* says the municipality of Shanghai is asking for tenders for electric lighting. The bids will remain open until Dec. 31 of this year, and the lighting is to commence April 1, 1891.

#### Locomotives for Australia.

The South Australian Government has decided to call for proposals for 14 narrow-gauge and 6 broad gauge locomotives.

#### A Large Pneumatic Tube.

The Johnson Pneumatic Tube Co. has built near Marion, N. J., an experimental tube 30 in. in diameter and 1,000 ft. long. It is made of No. 18 sheet steel, the sheets being 50 in. long. The joints are lap seam, and the tube is strengthened with cast-iron rings. The cars are spherical, weighing 750 lbs. each, and roll on a longitudinal steel rail 4 in. wide and  $\frac{3}{4}$  in. thick, fixed in the bottom of the tube. The spheres travel the 1,000 ft. in about 13 seconds, equal to about 53 miles an hour, 30 lbs. vacuum being used. Light cars of papier mache or other material are proposed.

#### Magnetic Influence of Locomotives on Watches.

A committee consisting of Messrs. Gentry, Meehan and Middleton reported to the Master Mechanics' Association on this subject at the recent convention. The committee had received considerable information by letter and otherwise. The committee is satisfied that irregularities in watches carried by locomotive runners are attributable to rough usage more than to magnetic disturbances, but it is considered that there is sufficient magnetic influence to make it desirable if possible to protect watches from it. There is much more danger, however, that the runners' watches are magnetized from exposure to electric plant than from any influences generated on the locomotive. The committee can recommend no system for protection against such influence, but it is convinced that much depends upon the handling of the watch and the care given it by the man in whose charge it is. An inferior timepiece, in the hands of a careful man, is sometimes more reliable than the finest watch in the hands of a runner who has no system in his method of winding, etc.



## THE SCRAP HEAP.

## Southern Industries.

The *Manufacturers' Record* prints the following table showing the new enterprises organized during the first six months of the last four years in 14 Southern states:

	First six months of	1889.	1888.	1887.	1886.
Iron furnaces.....	28	6	20	7	
Machine shops and foundries.....	77	72	53	40	
Agricultural implement factories.....	6	6	11	7	
Flour mills.....	82	72	68	48	
Cotton mills.....	79	44	45	48	
Furniture factories.....	44	33	33	18	
Gas works.....	12	18	24	15	
Water works.....	69	53	46	15	
Carriage and wagon factories.....	26	36	26	11	
Electric light companies.....	134	80	33	17	
Mining and quarrying enterprises.....	308	260	323	70	
Wood-working factories, including saw and planing mills, sash and door factories, stove factories, etc.	620	450	361	248	
Ice factories.....	36	33	55	30	
Canning factories.....	77	170	49	8	
Stove foundries.....	6	4	2	3	
Brick works.....	118	95	116	36	
Miscellaneous iron works, rolling mills, pipe works, etc.....	30	13	47	8	
Cotton compresses.....	21	20	26	7	
Cotton-seed oil mills.....	73	15	13	2	
Miscellaneous enterprises not included in foregoing.....	749	542	505	214	
Total.....	2,615	2,023	1,855	812	

It presents a gratifying view of a steadily increasing diversity of industries. It may be thought that the number of new iron furnaces is excessive as compared with the three classes of factories which may be looked to as consumers of iron, viz.: Machine shops and foundries, agricultural implement factories and miscellaneous iron works, but it is probable that the ratio of increase in furnaces will for some time to come be greater than in most other industries. It will be noticed that the greatest relative increase is in cotton-seed oil mills. The effect of these mills is to add about 1 cent per pound to the value of the planter's crop of cotton, and a large proportion of those returned is understood to be independent mills and in opposition to those controlled by the Trust.

The investments of capital is summarized as follows:

	First six months of	1889.	1888.
Alabama.....	\$14,520,000	\$14,940,000	
Arkansas.....	5,921,000	4,976,000	
Florida.....	1,222,000	2,030,000	
Georgia.....	10,003,000	5,792,000	
Kentucky.....	16,914,000	13,144,000	
Louisiana.....	4,878,000	1,776,000	
Maryland.....	6,975,000	3,119,000	
Mississippi.....	1,840,000	3,857,000	
North Carolina.....	4,588,000	3,999,000	
South Carolina.....	3,080,000	3,153,000	
Tennessee.....	8,079,000	6,025,000	
Texas.....	14,083,000	11,749,000	
Virginia.....	10,745,000	5,965,000	
West Virginia.....	5,499,000	3,965,000	
Total.....	\$108,933,000	\$81,508,000	

The *Record* has a med in the above statement to avoid as far as possible any overstatement and has omitted the capital stock of land companies, natural gas companies, building corporations and railroads, and it thinks that the tendency of companies to put their capital stock above the called-in cash is offset by a large number of small enterprises and the additions of machinery, etc., to concerns already in operation. As a matter of comparison the London *Economist* states that the subscriptions to new loans and stock companies during the current half year amount to £100,000,000, nearly twice the average of the five years from 1881 to 1887. In this same is included 19½ millions in trust companies, 16½ millions in railroad enterprises. Australia and India have taken over 9¼ millions, and about 5¼ millions have gone to foreign municipalities.

Probably after the investment of English capital at Middleborough, near Cumberland Gap, where \$4,000,000 has already been placed and \$7,000,000 more is expected to be expended in furnaces, mills and other enterprises, the Chesapeake and Ohio Dry Dock and Shipbuilding Works is the most important development in the South, if not in the country. The dry dock, which is 600 ft. long has been completed a little over two months, and the shipbuilding yard is being hurried forward to completion, so that it is hoped to lay the keels of two 3,500 ton freight steamers about the first of next year. Mr. C. P. Huntington is the principal owner, and when the yard is in operation it will employ 1,000 men.

## A Railroad Ferry Steamer Sunk.

The largest ferry steamer on the upper St. Lawrence, the "William Armstrong," of Ogdensburg, went to the bottom of the river June 30, while ferrying railroad cars from Morrisburg to Brockville, Ont. The steamer's regular work has been between Ogdensburg and Prescott, Ont., as a freight and passenger ferry for the Rome, Watertown & Ogdensburg and the Ogdensburg & Lake Champlain. She was also used in the excursion business. At the time of the accident she was carrying three cars loaded with coal, which were at one end of the boat. The steamer suddenly began to fill, and before anything could be done to save her she went down, being completely submerged. She lies near the Canadian shore. The vessel was valued at about \$20,000.

## The Congo Railway.

The Belgian Government has before its parliament a bill authorizing a grant of \$2,000,000 to the capital of the Congo Railway. A syndicate is ready to furnish \$2,000,000 additional. The bill proposes to pay the Government 3½ per cent. and other shareholders 7 per cent., and there is a provision that most of the material for building the road shall be purchased in Belgium.

## General Railroad News.

## MEETINGS AND ANNOUNCEMENTS.

## Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Canada Southern, 1½ per cent., payable Aug. 15.
Cheshire, 3 per cent. on preferred stock.
Chicago, Rock Island & Pacific, quarterly, 1 per cent., payable Aug. 1.
Delaware, Lackawanna & Pacific, 1½ per cent., payable July 20.
Evansville & Terra Haute, 1½ per cent., payable July 22.
Granite, 4 per share.
Huntington & Broad Top Mountain, \$1.25 on the preferred stock, payable July 22.
Lake Shore & Michigan Southern, 2 per cent., payable Aug. 8.
Long Island, quarterly, 1 per cent., payable Aug. 1.
Michigan Central, 2 per cent., payable Aug. 15.

Missisquoi Valley, \$2 per share, payable July 1.  
Norwich & Worcester, 4 per cent., payable July 5.  
Northern New Jersey, 1½ per cent., payable July 15.  
Pittsburg, Ft. Wayne & Chicago, quarterly 1½ per cent., and special quarterly 1½ per cent., payable July 1.  
Richmond, Fredericksburg & Potomac, 3½ per cent., payable July 1.  
Rutland, \$1 on preferred stock, payable July 1.  
St. Paul & Duluth, 2 per cent. on the preferred stock, payable July 15.  
Southwestern (Georgia), \$3.50 per share, payable June 20.  
Vermont Valley, 3 per cent., payable July 1.

## Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Alabama Midland, annual meeting, Montgomery, Ala., July 10.  
Campbell Hall Connecting, special, New York City, July 17.  
Chicago & West Michigan, special meeting, Muskegon, Mich., July 10.  
Delaware, semi-annual, 3 per cent., payable July 1.  
Duluth, South Shore & Atlantic, annual meeting, July 18.  
Hudson Connecting, special, 115 Broadway, New York, July 22.  
Marquette, Houghton & Antonayon, annual meeting, Marquette, Mich., July 18.  
Marquette & Western, annual meeting July 8.  
Oregon Short Line, special meeting July 17.  
Poughkeepsie & Connecticut, special meeting, 115 Broadway, New York, July 22.  
Utah & Northern, special meeting, Ogden, Utah, July 17.

## Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Traveling Passenger Agents' Association* will hold its next meeting in Plank's Hotel, Mackinac Island, Mich., July 9.

The *Association of American Railway Accounting Officers* will hold its next meeting at Niagara Falls, N. Y., July 10.

The *National Association of General Baggage Agents* will hold its next meeting at Detroit, Mich., July 17.

The *New England Roadmasters' Association* will hold its next meeting in Boston, Aug. 21.

The *Roadmasters' Association of America* will hold its seventh annual convention at Denver, Colo., Sept. 10.

The *Master Car and Locomotive Painters' Association* will hold its next annual convention in Chicago Sept. 11.

The *American Association of General Passenger and Ticket Agents* will hold its next semi-annual meeting in Atlanta, Ga., Sept. 17.

The *New England Railroad Club* meets at its rooms in the Boston & Albany passenger station, Boston, on the second Wednesday of each month, except June, July and August. The next meeting will be held Sept. 11.

The *Western Railway Club* holds regular meetings on the third Tuesday in each month, except June, July and August, at its rooms in the Phenix Building, Jackson street, Chicago, at 2 p. m.

The *New York Railroad Club* meets at its rooms, 113 Liberty street, New York City, at 7:30 p. m., on the third Thursday in each month.

The *Central Railway Club* meets at the Tift House, Buffalo, the fourth Wednesday of January, March, May, August and October.

The *American Society of Civil Engineers* holds its regular meeting on the first and third Wednesday in each month at the House of the Society, 127 East Twenty-third street, New York.

The *Boston Society of Civil Engineers* holds its regular meetings at its rooms in the Boston & Albany station, Boston, at 7:30 p. m., on the third Wednesday in each month.

The *Western Society of Engineers* holds its regular meetings at its hall, No. 67 Washington street, Chicago, at 7:30 p. m., on the first Tuesday in each month.

The *Engineers' Club of St. Louis* holds regular meetings in St. Louis on the first and third Wednesdays in each month.

The *Engineers' Club of Philadelphia* holds regular meetings at the house of the Club, 1,122 Gerard street, Philadelphia.

The *Engineers' Society of Western Pennsylvania* holds regular meetings on the third Tuesday in each month, at 7:30 p. m., at its rooms in the Penn Building, Pittsburgh, Pa.

The *Engineers' Club of Cincinnati* holds its regular meetings at the Club rooms, No. 24 West Fourth street, Cincinnati, at 8 p. m., on the fourth Thursday of each month.

The *Engineers' Club of Kansas City* meets at Kansas City, Mo., on the first Monday in each month.

The *Civil Engineers' Society of St. Paul* meets at St. Paul, Minn., on the first Monday in each month.

The *Montana Society of Civil Engineers* meets at Helena, Mont., at 7:30 p. m., on the third Saturday in each month.

The *Civil Engineers' Club of Kansas* holds regular meetings on the first Wednesday in each month at Wichita, Kan.

## Boston Society of Civil Engineers.

A regular meeting was held June 19. The following were elected members: Charles H. Bartlett, Frank E. Hall, Frederick S. Hunter and Hiram Nevins.

The Secretary was requested to convey to Mr. Hiram F. Mills the thanks of the society for courtesies received on the occasion of a visit to the experimental station for purification of sewage at Lawrence. It was voted to omit the regular meetings of July and August. Mr. Thomas Doane spoke briefly of a process of vulcanizing wood which had come to his notice, and which seemed worthy of investigation. Mr. F. F. Forbes read a paper on *Algae Growths in Water Supplies*, which was discussed by Prof. Brown, of Boston; Mr. Rafter, of Rochester, and Messrs. Fitz Gerald and Stearns.

## Montana Society of Civil Engineers.

The regular monthly meeting was held June 15 at the office of Mr. Bechler, Chief Engineer of the Montana Central. President Greene in the chair. A communication was read from T. H. Carter, M.C., calling attention to the fact that a committee of the United States Senate will be in Montana in August to investigate the question of canals and storage of water for irrigation, and by request Mr. Greene addressed the meeting on this subject. He asked the Society to take particular pains to collect information for the Senate committee. A committee was appointed for that purpose.

## National Electric Light Association.

A convention of this association will be held at Niagara Falls Aug. 6, 7 and 8. The Secretary, Mr. A. V. Garratt, No. 18 Cortlandt street, New York, requests suggestions as to subjects to be treated at the convention and as to the people who are most likely to be able and willing to discuss them. The usual concessions as regards railroad fares are made by the roads. The headquarters of the convention will be at the International Hotel. Mr. Benjamin Rhodes, of Niagara Falls, is Chairman of the Executive Committee, and will be glad to give any information that may be desired.

## Western Society of Engineers.

The 259th meeting of this society was held June 5, President E. L. Cortbell in the chair. The following new members were elected: E. C. Hammond, W. R. Kellogg, Wm. B. Vetterlein, Chas. A. Hasbrouck, Wm. Rufus Northway, Louis E. Cobb, Charles A. Arentz, Robert P. Brown, Daniel W. Maher, DeClermont Duval, Alfred G. Riter, Jules E. Roemheld, August Ziesing, John F. Wallace, Urban H. Broughton, G. W. G. Ferris, Eugene A. Rudiger and H. L. Bridgman. The evening was devoted to the discussion of proposed changes in the constitution and suggestions concerning the general policy of the society.

## PERSONAL.

—The resignation of Mr. Albert Fink, Trunk Line Commissioner, was accepted by the Board of Presidents at a meeting held in New York last week.

—Mr. Pulaski Leeds, Master Mechanic of the Louisville Division of the Louisville & Nashville, succeeds Mr. Harvey Middleton as Superintendent of Machinery on that road.

—Mr. Charles A. Coombs, who became General Manager of the New York & Northern last July, when the Receiver was discharged, has resigned, and the position has been abolished.

—Mr. R. C. White, foreman of the Louisville & Nashville shops at Birmingham, has been appointed superintendent of the East Birmingham Foundry & Machine Co., vice Mr. C. W. White, deceased.

—Mr. George W. McMillan, Chief of the Western Weighing Association in Omaha, died in that city, June 24. He was formerly associated with Chairman Faithorn on the Western freight bureau in Chicago.

—Mr. C. K. Bannister, Engineer of the Cheyenne & Northern branch of the Union Pacific, has resigned to accept a position with the Pacific Short Line, with charge of the construction work in Utah and Wyoming.

—Mr. L. Saunders, a farmer living near Ashland, Neb., has been presented by the Burlington & Missouri River Railroad with a gold watch for flagging a passenger train on June 15 and saving it from running into a washout.

—Mr. S. T. Wellman, formerly Superintendent of the plant of the Otis Iron & Steel Co., at Cleveland, O., has accepted the position of Consulting Engineer for the Illinois Steel Co., of Chicago, comprising the consolidated Chicago mills.

—Mr. Charles P. Clark, President of the New York, New Haven & Hartford road, sailed for Europe on the "Burgoyne" June 29. Mr. Clark will spend several weeks in England and France. His health has not been good for some time, and he goes abroad partly for rest.

—Chief Engineer William H. Hunt, of the navy (retired), died in Washington, June 26, at the age of 57 years. He entered the navy in 1853 as Third Assistant Engineer and was promoted to be Chief Engineer in 1863. He was placed on the retired list in 1871. During the war he served with Admiral Farragut's fleet during the attack on Mobile and in the capture of New Orleans.

—Mr. R. C. Blackall, Superintendent of Motive Power and Machinery Delaware & Hudson Canal Co., was presented with a handsome gold watch and chain by the members of the Master Car-Builders' Association at Saratoga last week. Mr. F. D. Adams, Master Car Builder of the Boston & Albany, made the presentation, in the parlors of Congress Hall, in the presence of a large assemblage of the Master Car-Builders and their friends.

—Mr. Harvey Middleton, who has been Superintendent of Machinery of the Louisville & Nashville since May, 1884, has resigned, to accept a similar position on the Atchison, Topeka & Santa Fe, to succeed Mr. George Hackney, who retires after a service of 13 years in this position. Mr. Middleton is 37 years old, and has been in railroad service since 1876. He has been Assistant Master Mechanic of the Philadelphia & Reading, Division-Master Mechanic of the Louisville & Nashville, and Master Mechanic of the St. Paul, Minneapolis & Manitoba.

—Mr. C. W. White, General Superintendent of the Birmingham Machine Foundry, and for nine years Master Mechanic of the South and North Division of the Louisville & Nashville, died at his home in East Birmingham, Ala., June 24, of consumption, after an illness of several months. He was 40 years old. Mr. White learned the machinist's trade at Grafton, W. Va., with the Baltimore & Ohio, shortly after the close of the war, and showed such fine mechanical ability that he was soon appointed foreman, and in 1875 he became Assistant Master Mechanic, serving in that position until the fall of 1877, when he resigned to go South, entering the service of the Louisville & Nashville, at Birmingham, as a machinist. His abilities soon asserted themselves and he was made Master Mechanic of the South and North Division in the spring of 1878, holding the place with marked ability until 1887, when he resigned to accept the position he held at the time of his death. He was universally known throughout the South as an expert on mechanical affairs, and was continually being consulted by people connected with the mechanical and iron industries of the busy valley at Birmingham. Mr. White was a member of the Master Mechanics' Association, a prominent mason, and a consistent Christian gentleman throughout his life. He joined the Presbyterian Church when a boy, and was an elder in the First Presbyterian Church, of Birmingham, at the time of his death. He was universally esteemed and respected by all who knew him. He leaves a wife and daughter to mourn his loss.

## ELECTIONS AND APPOINTMENTS.

*Atchison, Topeka & Santa Fe.*—George Hackney having resigned, Harvey Middleton has been appointed Superintendent of Machinery of the Atchison, Topeka & Santa Fe and the Chicago, Kansas & Western, with headquarters at Topeka, Kan.

*Burlington & Colorado.*—The annual meeting was held in Denver last week, and the following directors were elected: G. W. Holdrege, E. O. Wolcott, J. G. Taylor, William A. Higgins, D. T. Beas, H. D. Allee.

*Cairo, Vincennes & Chicago.*—The directors have elected the following officers: President, M. E. Ingalls; Vice-President, Anthony J. Thomas; Treasurer, M. S. Osborne; Auditor, M. Hill; General Superintendent, Robert Blee; Directors, M. E. Ingalls, Anthony J. Thomas, M. A. McDonald, James Fletcher and C. S. Elliott.

*Chesapeake & Ohio.*—W. J. McKee, Chief Train Dispatcher of the road, has been made Acting Superintendent of the line in place of I. G. Rawn, resigned.  
—F. Sullivan has been appointed Auditor, with office in Richmond, Va.



**Chicago, Milwaukee & St. Paul.**—The office of the traffic department will be removed to Chicago soon. The passenger department will occupy its present quarters in Milwaukee until after the Grand Army National Encampment. The officials who will be transferred are George H. Heafford, First Assistant General Passenger and Ticket Agent; George S. Marsh, Assistant General Passenger and Ticket Agent; W. D. Carrick, General Baggage Agent; W. E. Powell, General Immigration Agent; A. C. Bird, Freight Traffic Manager; J. H. Hiland, General Freight Agent; N. J. Goll, Second Assistant General Freight Agent, and D. C. Jones, Third Assistant General Freight Agent.

**Chicago, Rock Island & Pacific.**—Z. Hamer has been appointed Trainmaster at Kansas City, Mo., in charge of freight and passenger terminals, lines east and west of the Missouri River.

**Cincinnati, Hamilton & Indianapolis.**—The annual meeting of the stockholders was held at Hamilton, O., last week. They elected the following directors: Julius Dexter, John Carlisle, George Hafer, M. D. Woodford and Eugene Zimmerman, of Cincinnati; C. W. Fairbanks, of Indianapolis; R. D. Marshall, of Dayton; J. M. Ridenour, of Indianapolis, and James E. Neal, of Hamilton. Three of the old directors, C. C. Waite, A. S. Winslow and William Hooper retired. The Board organized by electing the following officers: Julius Dexter, President; M. D. Woodford, Vice-President, and F. H. Short, Secretary and Treasurer.

**Cincinnati, Richmond & Chicago.**—The annual meeting of the stockholders was held at Hamilton, O., last week, and the following directors were elected: Wm. Beckett, Julius Dexter, D. S. Gray, W. O. Hughart, T. D. Messier, J. E. Neal, F. H. Short, M. D. Woodford and Eugene Zimmerman. The old directors who retired are: C. C. Waite, of Cincinnati; M. C. Martin, of New Brunswick, N. S.; Henry A. Taylor, of New York, and R. D. Marshall, of Dayton.

**Cleveland, Cincinnati, Chicago & St. Louis.**—President M. C. Ingalls has announced the election of the following officers: George S. Russell, Treasurer, office in Cleveland; P. A. Hewitt, Auditor, office in Cleveland; E. F. Osborn, Secretary, office in Cincinnati; Oscar G. Murray, Traffic Manager, office in Cincinnati; Robert Blee, General Superintendent, office in Cleveland.

General Superintendent Blee announces the following appointments: E. A. Peck, Assistant General Superintendent, Cleveland; C. J. Steadwell, Superintendent of the Cleveland and Cincinnati Divisions, Cincinnati; J. O. Ewan, Superintendent of the Indianapolis Division, Indianapolis; J. Q. Van Winkle, Superintendent of the St. Louis Division, St. Louis; George W. Bender, Superintendent of the Chicago Division, Indianapolis. The division superintendents have made the following appointments. On the Cleveland Division: F. W. Hammit, Engineer Maintenance of Way, office at Cleveland; C. Potter, Roadmaster, office at Delaware; on the Chicago Division: T. O. Morris, Engineer Maintenance of Way, office at Indianapolis; A. J. Diddle, Roadmaster Eastern Division, office at Indianapolis; P. J. Kelly, Roadmaster Western Division, office at Kankakee, Ill.; on the Indianapolis Division: J. Fieser, Engineer Maintenance of Way, office at Indianapolis; N. O. Eastman, Roadmaster (West End), office at Union City, Ind.; H. Gardner, Roadmaster (East End), office at Bellefontaine; on the St. Louis Division: T. A. Sherwin, Engineer Maintenance of Way, office at Indianapolis; William Henry, Roadmaster, office at Indianapolis; J. Keenan, Assistant Roadmaster (West End), office at Mattou, Ill.; J. Regan, Assistant Roadmaster (East End), office at Indianapolis.

Under the consolidation W. F. Turrell's title is Superintendent of Motive Power of all lines, with office at Cleveland, O. He will have charge of all matters pertaining to the Mechanical Department, reporting direct to the General Superintendent.

E. E. Hudson has been appointed Master Mechanic of the Cleveland, Cincinnati and Indianapolis divisions, with office at Cleveland, O., and T. A. Lawes has been appointed Master Mechanic of the Chicago and St. Louis divisions, with office at Brightwood, Ind. Division Master Mechanics will report to the Superintendent of Motive Power in all matters connected with the Motive Power and Car Departments, and in all matters pertaining to the Transportation Department and Road Service, they will report direct to the Superintendents of their respective divisions.

**Coal Glen.**—The incorporators of this Pennsylvania company are: Warren A. Wilbur, President; Rollin H. Wilbur, Robt. F. Lendeman, Arnon F. Miller and Wm. H. Gummere, South Bethlehem, Pa.; Chas. H. Neisler, West Bethlehem, Pa., and C. F. Smith, Bethlehem, Pa.

**Colorado & Wyoming.**—The annual meeting of the road was held in Denver last week. The following directors were elected: G. W. Holdrege, J. G. Taylor, William A. Higgins, D. T. Beans and H. D. Allee, of Omaha.

**Dayton & Michigan.**—The stockholders last week elected the following directors: J. J. Emery, New York; Sheldon C. Reynolds and George E. Pomeroy, of Toledo, and Thomas Emery, R. B. Bowler, David Sinton, F. H. Short, Frank J. Jones, Robert Jenny, Robert Mecke and Charles J. Green, of Cincinnati. All the old directors were re-elected, and Sheldon C. Reynolds, of Toledo, and Charles J. Green, of Cincinnati, were added to the list.

**Dayton & Union.**—Robert Blee has been elected Vice-President and General Manager of the road.

**Denver & Rio Grande.**—At a recent meeting of the directors of the road the following officers were elected: President, D. H. Moffat; Secretary, William Wagner, and Treasurer, J. W. Gully; George Coppel, Chairman of the Board.

**Elgin, Joliet & Eastern.**—The directors have elected the following officers: Samuel Spencer, President; Norman Williams, Vice-President; F. E. Worcester, Secretary and Treasurer. The general offices are in the Royal Insurance Building, Chicago.

**Fort Scott, Pittsburgh & Southern.**—The incorporators of this Kansas company are: Charles L. Hyde, New York City; C. H. Hammett and A. E. Stillwell, Kansas City, Mo.; Frank Playter, Frank W. Lanyon, W. D. Ford and John R. Lindburg, of Pittsburgh, Kan.

**Galveston, Harrisburg & San Antonio.**—The following have been elected officers of this road and the Texas & New Orleans road: Julius Kruttschnitt, Vice-President; E. J. Huder, Treasurer; John Bagnell, Secretary and Auditor. Mr. Kruttschnitt will be General Manager of all lines in Texas, with headquarters in Houston.

**Indiana, Illinois & Iowa.**—R. M. Rogers, Jr., has been appointed General Freight and Passenger Agent of the company, with headquarters at Kankakee, Ill.

**Knoxville & Northeastern.**—Incorporated in Tennessee by Frank I. Stone, Robert Pritchard, Robert Morrison, W. K. Morrison, of Chattanooga; T. M. Steger, of Nashville, and J. P. McDonald, of Knoxville.

**Lake Shore & Michigan Southern.**—A. E. Billings has been appointed Division Freight Agent at Toledo, O. George F. McKay has been appointed Division Freight Agent at Cleveland, O. H. Bromley has been appointed General Agent at Cleveland, O.

**Leroy & Caney Valley.**—At the recent annual meeting in Larned, Kan., the following directors were elected: George J. Gould of New York, S. H. Clark of St. Louis, George C. Smith of St. Louis, J. H. Richards of Fort Scott, Kan.; Russell Harding of Wichita, Kan.; T. J. Hudson of Fredonia, Kan.

**Louisville, Evansville & St. Louis Consolidated.**—The Louisville, Evansville & St. Louis, the Tell City, Huntington & Cannelton, the Belleville, Centralia & Eastern, the Illinois & St. Louis Railroad & Coal Co., and the Venice & Carondelet companies, which have now been legally consolidated and will hereafter be operated as one property under the title of the Louisville, Evansville & St. Louis Consolidated Railway Co., with the following officers: W. J. Lewis, Secretary and Treasurer, and G. J. Grammer, Traffic Manager, with offices at Evansville, Ind. George F. Evans, General Manager, and J. J. Collier, Auditor, with offices at Louisville, Ky. P. F. Parke appointed Assistant Secretary and Treasurer, and C. H. Sharman, Superintendent of Construction at St. Louis.

**Louisville & Nashville.**—Pulaski Lee has been appointed Superintendent of Machinery, vice Harvey Middleton, resigned.

**Louisville, New Orleans & Texas.**—T. J. Nichols, President of the Natchez, Jackson & Columbus, has been appointed manager of the road, with headquarters at Memphis. He retains for the present the presidency of the Natchez, Jackson & Columbus.

**Mexican Gulf, Pacific & Puget Sound.**—The stockholders have elected S. N. Van Praag, Dennis Burns and A. G. Moreno, of Pensacola, and L. A. Van Praag and Gen. Daniel Macauley, of New York, as a board of directors. The officers are S. N. Van Praag, President, and A. G. Moreno, Secretary pro tem.

**Mexican National.**—J. N. Galbraith has been appointed Superintendent of the Northern Division, with headquarters at Laredo, Tex. J. L. Williams has been appointed Train Master, with headquarters at the same place.

**New York, Lake Erie & Western.**—John S. Matson has been appointed Superintendent of the Eastern Division of the New York, Pennsylvania & Ohio, vice C. A. Brown, promoted to be Superintendent of the Buffalo Division of the New York, Lake Erie & Western.

George W. Conkling, Trainmaster of the Susquehanna division, has been made Trainmaster and Traveling Engineer of the Bradford division of the same.

**New York & Northern.**—C. A. Coombs having resigned the position of General Manager, the office has been abolished. The Superintendent, the General Freight and Passenger Agent and the Auditor, now report to the President.

**Ohio & Northeastern.**—The incorporators of the Pennsylvania road are: J. J. Miller, President; J. A. Courtney, W. A. Dinker and W. I. Miller, all of Pittsburgh; D. H. Brown, James Campbell and C. R. Sewell, Allegheny City.

**Oregon Railway & Navigation Co.**—At a meeting of the directors at Portland, Ore., this week, the following officers were elected: President, Edmund Smith, Philadelphia; First Vice-President, W. S. Ladd, Portland; Second Vice-President, W. H. Holcomb, Omaha; Secretary, Theodore Wyzant, Portland; Assistant Secretary, Prosper W. Smith, New York.

**Pacific Short Line.**—The directors of the Nebraska & Western, the Wyoming & Eastern and the Salt Lake Valley & Eastern have elected David Mackenzie Vice-President and General Manager, with headquarters at Sioux City, Ia. The New York office is at 10 Wall street, New York.

**Paris, Marshall & Sabine Pass.**—The following Board of Directors was chosen at a meeting held in Paris, Tex., June 25: R. D. Hasslip, A. Gilmer, W. A. Fletcher, E. J. Fry, J. S. Grace, John Martin, B. J. Baldwin and D. H. Scott. The Board of Directors then elected the following officers: D. H. Scott, President; R. D. Hasslip, Vice-President; B. J. Baldwin, Jr., Secretary; E. J. Fry, Treasurer; J. W. Harl, General Manager.

**Pitkin County.**—The directors of this new Colorado company are: H. A. W. Tabor, Donald Fletcher, J. F. Cornforth, Ira W. Pendleton, L. M. Babcock, W. R. Reynolds and E. S. Kessler, all of Denver. The principal offices will be in Denver.

**Redondo Beach.**—At the recent annual meeting, in Los Angeles, the following directors were elected: A. Branson, President; D. McCool, General Manager; George H. Peck, General Solicitor; H. Silver, Secretary and Treasurer; F. H. Pattee, Assistant Secretary; G. L. Goodwin, Assistant Treasurer; F. T. Ferris, Chief Engineer; J. P. Whitehead, Comptroller; J. W. Kuehnert, General Auditor; Anson Brunson, W. W. Ross, Charles Prager, E. H. Lamme, H. Silver, directors.

**Rio Grande Junction.**—The board of directors of this new Colorado company is as follows: David H. Moffat, Walter S. Cheesman, Sylvester T. Smith, Joseph W. Gully, Andrew S. Hughes and E. R. Murphy.

**Shepan, Litchfield & Northern.**—The following is a list of the new officers: President, George D. Chapman; Vice-President, Harold Clemons; Secretary, T. Z. Brown; Assistant Secretary, W. L. Ransom; Treasurer, Charles H. Coit.

**South Bound.**—At the annual meeting in Savannah June 26 the following directors were elected for the ensuing year: John L. Hammond, Herman Myers, B. A. Denmark, William S. Tison, J. F. Minis, T. F. Stubbs, John Lawton. The directors elected the following officers: Herman Myers, President; B. A. Denmark, Vice-President; William S. Tison, Secretary and Treasurer.

**Utah Western.**—The directors are John W. Young, Isaac M. Wadell, Daniel Harrington, W. A. Rossiter, Charles W. Hardy, John M. Whitaker, D. J. Williams, B. W. Briggs, Jr.; J. H. Young and D. H. Goddard.

**Waukegan & Southwestern.**—The incorporators and first Board of Directors are: C. S. Holt, of Lake Forest; H. Fyfe, Russell W. Whitman, A. F. Towne and Arthur D. Wheeler, of Chicago.

#### OLD AND NEW ROADS.

**Austin & Northwestern.**—The company has made a proposition that if the residents along the route will grade, bridge and bear all the expense of building a road from a connection with the Austin & Northwestern, at Burnet to Lampasas, 21 miles, the company will lay the rails and operate the line. The Lampasas, Burnet & Southwestern has been chartered to build the line.

**Belleville, Centralia & Eastern.**—The surveyors are making the final location of the route into and through the town of Centralia, Ill. The right of way has been secured from Mt. Vernon to Walnut Hill, a point southeast of Centralia. Contractors have been inspecting the line from Centralia west to Belleville, 60 miles from Mt. Vernon.

**Cairo, Vincennes & Chicago.**—Anthony J. Thomas and Charles E. Tracy, Receivers of the Cairo Division of the Wabash, St. Louis & Pacific, and Trustees in the Cairo Division mortgage of the Wabash, St. Louis & Pacific, on July 1 surrendered and delivered full possession of the railroad and property known as the Cairo, Vincennes & Chicago line, together with all its leasehold, rights, etc., to the Cairo, Vincennes & Chicago Railway Company, which company will control and operate the road from and after July 1, 1889. All unsettled debts, liabilities, etc., arising out of or connected with the possession and operation of the road by the receivers will be settled by the receivers.

**Canadian Pacific.**—The gross earnings for the month of May were \$1,106,009, and the operating expenses \$725,500, leaving a net profit of \$380,509, against a net profit of \$235,051 for the same month last year. The gross earnings for five months ending May 31 were \$5,114,133, and operating expenses \$3,664,173, leaving net profits of \$1,449,960, against net profits of \$722,931 for same period last year.

**Central of Georgia.**—The bonds for the Savannah & Western having been placed, the contract for the branch from Eden, Ga., 20 miles west of Savannah, to Eastman, on the East Tennessee, Virginia & Georgia, will be let at once. The extension from Eastman to Americus will intersect the Georgia Southern & Florida near Cordele.

**Chicago & Atlantic.**—Receiver Malott has filed in the United States Court a statement of the financial condition of the company, of which he recently took charge. It enumerates debts beyond the bonded indebtedness as follows: To a car trust, \$423,058; to employees, \$43,748; to the Chicago & Western Indiana road, net, \$73,789; Brooks Locomotive Works, \$61,025.

**Cincinnati, Alabama & Atlantic.**—The locating surveys at Tallahoma and in southern Tennessee are being rapidly completed, and it is expected to have the grading under way between Tallahoma and Fayetteville, Tenn., by July 1. A mortgage has been recorded in Alabama to secure an issue of \$700,000 five per cent. bonds.

**Cincinnati, Wabash & Michigan.**—It is stated that President J. H. Wade, who controls the majority of the stock of the company, is conducting negotiations with D. J. Mackey, President of the Evansville & Terre Haute and other roads, looking to the purchase by the latter of the majority of the stock of the road. The line extends from Benton Harbor, on Lake Michigan, south to Anderson, Ind., 165 miles. The trains of the company run over the tracks of the Cleveland, Columbus, Cincinnati & Indianapolis to Indianapolis, 34 miles south of Anderson, under a trackage contract. The company has a capital stock of \$2,044,000, and a bonded indebtedness of \$812,000, with a surplus of over \$300,000.

**Coal Glen.**—Organized in Pennsylvania to build a road from or near the village of Coal Glen, in Jefferson County, to a point on the Ridgeway & Clearfield road, at or near Beech Tree Junction, in the same county, a distance of about five miles. The capital stock is \$50,000.

**Confidence & Oakland.**—Tracklaying will soon commence on this road, nearly all the grading being now completed. It is being built from Confidence, Seymour County, Pa., southeast to Oakland, Garrett County, Md., to open up timber and mineral lands, owned by the Youghiogheny Manor Land Co. The road will be 35 miles long, and will connect at Confidence with the Pittsburgh Division of the Baltimore & Ohio, and at Oakland with the main line of the same road. Charles S. Stewart, of Lancaster, Pa., has been given a contract for building 10 miles of this road. Kennedy & Crosson, of Philadelphia, have a contract for seven miles of the line. The company is building the rest of the line by day labor, under direction of its officers. J. Bayard Henry is President, and Joseph U. Crawford, General Manager and Chief Engineer, with office at 742 Drexel Building, Philadelphia.

**Denver & Rio Grande.**—The track on the extension from Sapinero south to Lake City, Col., was finished to the latter town June 23, 2½ miles of track being laid on that day to complete the work.

**Evansville & Richmond.**—Tracklaying is progressing at the rate of three-fourths of a mile a day on the road. The work is being done by a tracklaying machine.

**Fort Scott, Pittsburgh & Southern.**—This company has filed a charter in Kansas to build a road from Fort Scott to Pittsburgh, thence to the south line of Kansas, passing through the counties of Bourbon, Crawford, Cherokee, Labette, Linn, Allen and Anderson in Kansas, and the county of Jasper in Missouri. The capital stock of the company is \$1,000,000.

**Houston, Central Arkansas & Northern.**—The company has given a mortgage to the Atlantic Trust Co. of New York on 314 miles of road from Pine Bluff, Ark., to Burr's Ferry, on Sabine River, at the rate of \$15,000 per mile. The bonds are to be issued as each mile of road is completed.

**Kansas City & Excelsior Springs.**—Organized in Missouri to build a road, eight miles long, from Missouri City to Excelsior Springs, connecting at the latter point with the Wabash. The capital stock is \$50,000. The surveys are now being made, and right of way is being secured.

**Kansas City, Fort Smith & Southern.**—The locating survey for the extension of this line south toward Fort Smith, Ark., has been finished to beyond Decatur, Ark., and will soon reach the former point. It is expected to begin grading this month.

**Kansas City, Memphis & Birmingham.**—The Carbon Hill branch of the road from Carbon Hill, Ala., four miles out to the coal mines, was finished last week.

**Kansas City, Watkins & Gulf.**—Kennedy & Stone, of Topeka, Kan., who, as already stated, have been awarded the contract for building 50 miles of this road, commenced work at Lake Charles, La., June 25, amid the enthusiastic plaudits of some hundreds of spectators.

**Kentucky Midland.**—The section of this road from Frankfort, east to Georgetown, Ky., was opened for business this week. The line will soon be opened to Paris.

**Knoxville & Northeastern.**—Charter filed in Tennessee to build a road from Knoxville to Danbridge, in Jefferson County, with branches to Sevierville and Newport, passing through newly discovered iron ore beds.

**Lexington Belt.**—M. Dolan & Sons, of Lexington, have been awarded the contract for building the belt road at Lexington, Ky., and are to have it finished by Oct. 1. The line will extend from the Cincinnati Southern main track to the Newport News & Mississippi Valley Co.'s main track.



**Lake Shore & Michigan Southern.**—The statement for the half-year (June, 1889, partly estimated) as compared with the half-year ending June 30, 1888, is as follows:

	1889.	1888.	Inc. or Dec.
Gross earnings.....	\$8,752,454	\$8,667,889	I. \$84,565
Oper. expen. and taxes.....	5,834,324	5,384,222	I. 450,102
Per cent.....	66.66	62.12	
Net earnings.....	\$2,918,130	\$3,283,667	D. \$365,537
Int., rent. and divs.....	1,755,000	1,804,307	D. 49,307
Leaves.....	\$1,163,130	\$1,479,360	D. \$316,230
Equals per share.....	\$2.35	\$2.99	D. 0.64

**Louisville, New Albany & Chicago.**—The track-layers on the extension from Howlands to Massachusetts avenue, in the city of Indianapolis, are pushing the work, and have the line completed to Lincoln avenue. It will be about two miles long.

**Louisville, New Orleans & Texas.**—The branch from Slaughter to Bayou Sara, La., a distance of 15 miles, has been completed, and the line will soon be put in operation. The extension from Rolling Fork to Hampton, Miss., is also nearly completed and trains will soon be running.

**Louisville, St. Louis & Texas.**—It is proposed to build a short branch north to Brandenburg, Meade County, on the Ohio River, from a point at or near Weldon, 18 miles west of West Point, and several routes have been surveyed; by one the line is  $2\frac{1}{2}$  miles long, and by another five miles.

**Michigan Central.**—The following is the statement of the business for the six months ending June 30 as compared with that of the previous year, June being partly estimated:

	1889.	1888.	Inc. or Dec.
Gross earnings.....	\$6,233,000	\$6,535,000	D. \$302,000
Op. expen. and taxes.....	4,424,000	4,725,000	D. 301,000
Per cent.....	(70.9)	(72.3)	
Net earnings.....	\$1,809,000	\$1,810,000	D. \$1,000
Int. and rentals.....	1,260,000	1,260,000	
Surplus.....	\$549,000	\$550,000	D. \$1,000
Proportion to Can. So.....	156,000	159,000	D. 3,000
Leaves.....	\$393,000	\$391,000	I. 2,000
Dividends.....	374,764	374,764	
Balance.....	\$18,236	\$16,236	2,000

**Missouri, Kansas & Texas.**—The receivers have awarded a contract for building an extension of 17 miles between Lancaster and Waxahachie, Tex., to J. P. Hughes, of Fort Worth. There were seven bidders for the job. The work is to be paid out of the earnings of Missouri, Kansas & Texas lines. It is an extension of the 15 miles built by the receivers between Dallas and Lancaster last fall.

**Nashville & Knoxville.**—On the section from Buffalo Valley east to Cookeville, Tenn., 22 miles, about 12 miles is ready for track laying. At Buffalo Valley the bridge over the Caney Fork, being built by the Penn Bridge Co., is about half finished and track will be laid across it by Oct. 1. J. C. Rodimer & Co., of Gallatin, Tenn., have the contract for the grading and masonry from the Caney Fork River to Cookeville. The road beyond Cookeville has not been located, and will not be until all the surveys are completed from Cookeville to the coal fields in Pentress County, a distance of about 30 miles. The management hope to be able to have this section ready for letting this fall. The road is completed and in running order from Lebanon to Buffalo Valley, Tenn., at the crossing of the Caney Fork River at that point, a distance of 37 miles; also, from Gordonsville, Tenn., to Carthage, on the Cumberland River, nine miles. The total distance operated is 46 miles. About 30 miles of the track is ballasted with broken limestone.

**Newfoundland.**—The bill before the legislature of Newfoundland authorizing the construction of 300 miles of railroad to the northern part of the colony provides that the road must be completed in ten years. The bill enables the government to borrow the money required on the credit of the colony, the amount to be \$12,500,000, at  $3\frac{1}{2}$  per cent., to be taken in instalments as the work progresses. There is a provision for a sale of the whole line, so that if it is deemed desirable at any time during construction to dispose of the road tenders for purchase may be called for. A large amount of bridging will be required. The line will cross fertile valleys and a large mineral tract, and its terminus will be in the copper mining region.

**New York Central & Hudson River.**—The following tables give the net earnings and expenses for the three months and the nine months ending June 30, the earnings for 1889 being estimated:

Three months to June 30:			
	1889.	1888.	Inc. or Dec.
Gross earnings.....	\$8,785,000	\$8,469,837	I. \$315,163
Operating expenses.....	5,917,000	5,805,361	I. 111,639
Net earnings.....	\$2,868,000	\$2,664,476	I. \$203,524
Fixed charges.....	1,953,000	1,954,860	I. 8,140
Profit.....	\$905,000	\$709,616	I. \$195,384
Dividend.....	894,000	894,283	
Surplus.....	\$11,000	\$184,667	D. \$173,667
Nine months to June 30:			
Gross earnings.....	\$25,990,000	\$26,642,839	D. \$652,839
Operating expenses.....	17,380,000	18,077,899	D. 697,899
Net earnings.....	\$8,600,000	\$8,564,960	I. \$35,040
Fixed charges.....	5,890,000	5,864,589	I. 25,420
Profit.....	\$2,710,000	\$2,700,380	I. \$9,620
Dividend.....	2,683,000	\$2,682,849	
Surplus.....	\$27,000	\$17,531	I. \$9,469

**New York, Lake Erie & Western.**—The surveys have been completed for the projected extension from near Susquehanna to Honesdale, Pa., 21 miles, which, if built, would save many miles of haul on the coal transported to New York from Forest City and Carbondale.

**Northern Pacific.**—The contract for grading the Jamestown & Northern extension from Minnewaukan, N. D., to Leeds has been let to E. McCormack.

**Ohio & Northwestern.**—A charter has been filed by this company, in Pennsylvania, to build a road from a point at the Youghioghy River, at the mouth of Jacobs Creek, at or near Smithton, extending northeastwardly to a point at or in the borough of Latrobe. The length of the road will be about 25 miles, and it will be all in Westmoreland and Fayette counties. The capital stock is placed at \$250,000.

**Old Colony.**—Work is being rapidly pushed on the Wrentham Branch, nearly 13 miles long. McCarthy Bros., of Franklin, Mass., have the contract for the grading on the whole line, and for the masonry on the northerly part, and Joseph Ross, of Ipswich, Mass., has the contract for the masonry on the southerly part. The line begins in North Attleboro at a point on the North Attleboro

branch of the Providence Division, about half a mile easterly from its westerly terminus, then runs through North Attleboro on the westerly side of the town, through Plainville in the southerly part of the town of Wrentham, through Wrentham Centre, through Pondville, in the easterly part of the town of Norfolk, to a point on the Northern division in the town of Walpole,  $1\frac{1}{2}$  miles southerly from its junction with the New York & New England. There are to be no grade crossings. Eighteen highways are to be crossed by carrying the railroad over or under them. One stone arch will be built across the Ten Mile River, in North Attleboro. The contract for building plate girder bridges for all the crossings over highways is let to the Boston Bridge Works, Boston.

**Pennsylvania, Poughkeepsie & Boston.**—Application has been made in Philadelphia for an injunction to restrain the road from building its proposed line from Slatington, Pa., to Campbell Hall, N. Y., on the line of the projected route of the Harrisburg & Eastern Railroad. The point in dispute is the site chosen for a bridge crossing the Lehigh River at Slatington, which site has been chosen by both companies. The hearing is fixed for July 30. The Poughkeepsie Bridge is the objective point of both lines.

**Philadelphia & Reading.**—Two judgments, aggregating \$100,000, were decreed by the Court of Common Pleas in Philadelphia last week against the company in favor of holders of convertible judgment scrip of the company. In 1884, when the company defaulted in interest on the scrip, the plaintiffs accepted income bonds in par in settlement, and with the understanding that if the company gave any better terms to other holders they were also to receive such benefit. They showed that a large stockholder's scrip had been exchanged at par by the company on a 56 per cent basis for the income bonds, and the amount recovered in judgment is the difference in the two rates of exchange.

**Pitkin County.**—Incorporated in Colorado to build a road commencing at the city of Aspen and extending to Tourtelotte Park, Richmond Hill and Ashcroft, also a branch northeasterly to Hunter Park. The capital stock is placed at \$300,000.

**Puget Sound & Gray's Harbor.**—Contractor Gibbon has received a contract from this company to build the road from Summit, W. T., to Montesano, W. T. The first section from Summit to Elma Mr. Gibbon has sublet to Contractor Fitzgerald, who has already placed 300 men at work in the three camps he has established, and soon he will increase the number to 800.

**Richmond & Danville.**—The Richmond & Danville on July 1 assumed control of the High Point, Randleman, Ashboro' & Southern road, extending from High Point to Ashboro', N. C., a distance of 28 miles, and will hereafter operate the line as a part of the Richmond & Danville division, and under the charge of Mr. W. B. Ryder, Superintendent, Richmond, Va.

**Rio Grande & Eagle Pass.**—It is stated that this road is to be immediately extended to new coalfields, 35 miles above Laredo, Tex., on the banks of the Colorado River.

**Rio Grande Junction.**—The company has filed a charter in Colorado to build a road from Rifle Creek, in Garfield County, down the Grand River to G and Junction on the Denver & Rio Grande, being a distance of 64 miles. The capital stock is \$2,000,000.

**San Antonio & Aransas Pass.**—The amount which the company asked of Laredo, Tex., to have the locating survey made of the extension from Kennedy south to Laredo, 135 miles, has been raised in that town, and the survey will soon be finished.

**Sierra Valley & Mohawk Valley.**—Judge Sawyer, of the United States Circuit Court at San Francisco, has given a decision in favor of the Farmers' Loan & Trust Co., of New York, in a suit against the railroad company. The suit was brought by the trust company to foreclose a mortgage of \$350,000 held against the company's road through Lassen and Plumas counties. The line is only completed from Moran Junction, Cal., for 15 miles; it is projected to Mohawk, 41 miles from Moran Junction.

**Sinslaw & Western.**—The directors have voted to make a preliminary survey immediately of the line from Eugene City, west about 50 miles to Florence, Or., on the Pacific Coast, at the mouth of the Sinslaw River. O. Boomhower, of Eugene City, is General Agent.

**Ulster & Delaware.**—The Board of Railroad Commissioners of New York have decided to grant the petition of the company for a certificate relieving it from the obligation to extend its road on the line of the old Rondout & Oswego Railroad (whose property and franchise the Ulster & Delaware bought under foreclosure), from Stanford through the town of Harpersfield, in Delaware County, to Oneonta; inasmuch as there is a line in course of construction, paralleling the old route and only a few miles from it, which will accommodate a larger territory. The line which is being constructed will connect with the Delaware & Hudson, making a through line from Rondout to Oneonta. The town of Harpersfield resisted the application of the Ulster & Delaware on the ground that the town had bonded itself for \$100,000 to enable the old Rondout & Oswego Co. to build a road through the town, and had never received any benefit from it.

**Union Pacific.**—Work on the Carbon cut-off in Wyoming, which is intended to tap some of the new coal mines in that state, has been resumed.

**Utah Western.**—Chartered in Utah to build a road, 30 miles long, from Salt Lake City to Beck's Hot Springs and thence to Great Salt Lake. The capital stock is \$600,000.

**Waukegan & Southwestern.**—Incorporated in Illinois to construct a railroad from the city of Waukegan, Lake County, through the counties of Lake and Cook to a point of junction with the Elgin, Joliet & Eastern, in the township of Hanover, Cook County. The capital stock is \$1,000,000.

## TRAFFIC.

### Traffic Notes.

General Passenger Agent S. W. Snow, of the Wabash system has issued a circular annulling the previous order forbidding agents to receive commissions from foreign roads for the sale of tickets.

The Trunk Line Presidents were unable to take any action towards the raising of dressed beef rates, the five year contract of the Baltimore & Ohio with a Chicago firm at 45 cents having proved an insurmountable obstacle.

The Atchison, Topeka & Santa Fe has made a close traffic agreement with the Wabash Western for business between St. Louis and the Pacific Coast, and a similar one with the Chicago & Northwestern for the interchange of traffic at Superior, Neb.

Chairman Abbott has given permission to the roads in the Western States Passenger Association to reduce the passenger rate between Chicago and Denver to \$25, in accordance with the action of the Chicago & Alton. The reduced rate went into effect July 2.

The claim of the Atchison that its rate was made to meet competition is not accepted by the Executive Board and is characterized as an afterthought. Moreover, competition at El Paso is not the "direct competition" referred to in sec. 6 Art. 2 of the agreement.

The Chicago & Alton has given notice that on live stock from points on the Chicago, Rock Island & Pacific west of the Missouri River it will make the same rates to Chicago as are made by the Rock Island, the proportion east of Kansas City being in de very low to balance the high local rates west of there.

An application has been made to the Treasury Department for leave to take a number of Chinese laborers through the United States to the West Indies, but pending the slow consideration of the question at Washington a Canadian line secured the business, and will take the passengers across the continent without passing through the United States.

The "Seaside Special" is the name given by the Chicago & Grand Trunk to its Pullman vestibule train which is to make weekly trips between Chicago and Portland, Me., via Niagara Falls, Thousand Islands and the White Mountains during the summer. The cars were on exhibition at Chicago last week. It does not appear that they are brand new.

The Canadian Pacific some time ago applied for leave to give bonds for taking through the state of Maine freight on which duties had not been paid. This application was not acted upon, and it was given out that the company would have to abandon its line through the state of Maine, but a dispatch of Monday of this week explodes this silly statement, the announcement being made that an arrangement had been arrived at in connection with the Maine Central by which traffic would be conducted.

The Atchison, Topeka & Santa Fe has announced that the low rates to and from Wichita, ordered by the Kansas Railroad Commissioners, will be applied to all the large cities on its line in the state of Kansas. This will probably include Lawrence, Topeka, Abilene, Hutchinson, Arkansas City, Winfield, McPherson, Emporia and Larned. This action will probably neutralize to a considerable extent the hoped for advantage at Wichita. The general effect of this change is estimated will be a reduction of about 10 per cent.

Certain shippers having made a complaint before the Nebraska Board of Transportation against the Chicago, St. Paul, Minneapolis & Omaha concerning rates on live stock and on coal, the Secretary of the board has drawn up a report recommending certain reductions on these commodities; but the report has not been agreed upon, and the recommendations embodied in it do not appear to be final even when approved. The dispatches sent out announcing a heavy reduction on all the roads in the state are therefore misleading.

The new reduced lumber rates from Chicago to Missouri River points have been extended to points west of Omaha, but their application to places beyond southwestern Missouri River points has been stopped by the protest of the St. Louis & San Francisco. The rates from Chicago, and from St. Paul as well, were made to apply only on soft lumber, laths and shingles, but the Minneapolis & St. Louis refuses to confine them to these commodities and will reduce on cedar posts, telegraph poles and paving blocks. The other roads will have to do likewise.

The Executive Board of the Inter-state Commerce Railway Association has issued a decision on the action of the Atchison, Topeka & Santa Fe in reducing rates to Trinidad, Col., without notifying the Association beforehand. It appears that on June 1 the Atchison issued a new tariff from Chicago and other Eastern points to El Paso, Tex., which, according to the Inter-state Commerce law, was applied to Trinidad, Col. This place is a competitive association point and the new tariff was lower than the one then in effect to that place. The Chairman of the Trans-Missouri Association fined the road \$100 for violating Sec. 8 of Art. 2. The first defense of the Atchison was, that El Paso being without the jurisdiction of the Association, the road could make such reduction as it saw fit, and that for the effect on Trinidad rates the company was not responsible. It further claimed that its action was justified by the provision that any company could, "at its peril," make rates to meet outside competition without previous notice. The Atchison appealed from the fine to the Executive Board. Various arguments were offered in the defense of its action, but the Executive Board characterized them as weak, and says that, as the object of the Association is mutual protection by establishing and maintaining reasonable rates, this reduction is wholly vicious. The opinion goes on: A common interest in the rates which are established to the territory defined is conceded as the very basis of the structure. A mutual interdependence among the tariffs of all the association lines is a fact too prominent to be easily overlooked, and too notorious to be properly forgotten. The benefits which each line expects to derive from harmonious action under established rules involve obligations to associates in cases where their revenues are affected. To admit an exception in cases when the point in view lies beyond the territorial boundary, is to weaken the usefulness of the association to a degree which its framers cannot be believed to have contemplated. It is not the rates to El Paso which are under consideration, but the rates to Trinidad. In suddenly and without notice reducing its rate to Trinidad, the Atchison Co. acted upon a matter strictly within the jurisdiction of the Trans-Missouri Association, and its action was not in conformity to the Association rules. Those rules (Sec. 4, Art. 2), require five days' notice prior to the monthly meeting of the Freight Committee, and if no agreement is then reached the rate can be put in after ten days' notice, or the matter may be referred to the arbitration of the Executive Board, subject to the final right of the party to make the rate notwithstanding an adverse decision by the arbitrators. It was therefore possible for the Atchison to have established its El Paso tariff, with all its consequences, by acting strictly in conformity to the rules to which it was a party. The delay involved may be, at times, annoying; but the fact that time is required to give effect to the machinery of the Association is not the least valuable feature of its organization. Too hasty action in such matters is always to be deprecated; and time sufficient to develop all the collateral effects of a proposed change is essential for the safety of every line. An apt illustration of this is afforded by the present case; for it is hardly credible that the Atchison company would have entered into the El Paso arrangement so willingly if the effect in respect to traffic from Ohio River points had been clearly perceived in advance of making the announcement. It even admits that it did not foresee the effect which its El Paso tariff would have upon Trinidad and Santa Fe. No better example could be given of the value of a procedure which involves the employment of sufficient time for conference between all parties interested, and the development of every possible result that may flow from any proposed course of action.